IMPLICATIONS FOR EQUITY IN ENTRY-LEVEL ASSESSMENT: A STUDY OF SELECTED STUDENT CHARACTERISTICS AND PLACEMENT TEST SCORES

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CHAPTER I

INTRODUCTION

For many years, American higher education has been facing complex issues that have challenged the nature and structure of the academy (Bean & Hossler, 1990). The proper placement of academically under-prepared students continues to be notable among these critical matters. Placing students in correct courses to heighten their probability of success is a vital topic for colleges and universities. Although proper placement does not ensure student success, there does appear to be a relationship between entry-level assessment and subsequent academic performance (Gordon, 1999; Saunders, 2000). With declining financial resources, it is imperative that administrative decision-makers focus their efforts on tasks that target student learning and success (Donald, 1997).

The challenges facing higher education have been driving a call for reform (Lewis, 1997). Colleges and universities must examine current practices to determine their effects on student attainment. Internal and external forces require administrators to focus on efficiency and effectiveness (Donald, 1997). As a result, it is imperative that students be placed in courses in a manner that is not only effective, but also fair and reasonable.

While the academic placement of students via entry-level testing programs is a common policy on community college campuses, there have been critics of this practice. Studies have suggested that such testing and placement may actually place at-risk students at even more of a disadvantage by placing them in courses of questionable value

against their will (Utterback, 1998). Other research has highlighted the problems associated with entry-level tests that have little relationship to the content of the courses into which students are placed based upon their scores on such tests (Armstrong, 2001). In light of these potential drawbacks, there is little disagreement that the challenges presented by under-prepared students stretch the resources of campuses and make ever more critical the need for effective entry-level programs. Riehl (1994) noted that open door institutions "must either accept a lower retention rate, or attempt to improve it through the development of policies and practices especially designed to serve the students they admit. The first step in developing such policies and practices is to gain a clearer understanding of the academic background and aspirations of their students" (p. 15).

Educators have argued for the value of mandatory academic placement in the first year of college as a means to foster student success (Gamble, 1994). One such academic placement mechanism commonly used to place students at the proper academic level is the Computerized Placement Test (CPT), developed by The College Board. The CPT is a norm-referenced exam designed to measure the English, reading, and mathematics achievement levels of entering college students. Because the CPT is easily administered and scored, and because it appears to be a reliable instrument, it has been used on many campuses across the United States. Currently, 697 institutions use the CPT testing system (S. Murphy, personal communication, August 26, 2002).

Academic placement programs can play a unique role in advancing student learning to a higher level of understanding and integration. Research evidence suggests proper placement during the freshmen year yields improved student performance and

increases student learning (Curtis, 2000; Gordon, 1999). Yet, placement programs across the country are often vastly different at each institution of higher education. Skeptics of student academic placement programs question the actual empirical effectiveness and positive outcomes that such programs claim to provide for new students at institutions of higher education (Utterback, 1998; Sidle & McReynolds, 1999).

Various studies of the characteristics associated with effective learning have indicated a number of factors that relate to student success (Bean & Metzner, 1985; Bodi, 1992; Kuh, Schuh, & Whitt, 1991). One of the most important to emerge has been status as a "first-generation" college student (Riehl, 1994; York-Anderson & Bowman, 1991). The phrase "first-generation" has been used to describe a myriad of students. The U.S. Department of Education guidelines for TRIO programs (e.g., Upward Bound, Educational Talent Search, Veterans Upward Bound, Student Support Services) define a first-generation student as "an individual neither of whose natural or adoptive parents received a baccalaureate degree" (Upward Bound Program, 34 CFR Ch. VI, p. 208). York-Anderson and Bowman (1991) used the definition that neither parent had attended college for one year. Nunez and Cuccaro-Alamin (1998) defined first-generation as a student whose parents had never enrolled in postsecondary education.

Although there is no universally accepted definition, the literature renders little doubt that first-generation students are at-risk for failure. York-Anderson and Bowman (1991) found that first-generation students perceived less family support for their college and had less information about college than did non-first-generation students. Not surprisingly, first-generation students showed lower grade-point-averages, higher attrition

rates, and lower academic aspirations (Riehl, 1994). In short, first-generation students may not be academically or socially prepared for college.

Research on first-generation college students has received increased attention in recent years. The preponderance of first-generation studies have focused on various measures of persistence and outcomes comparing first-generation students with their non-first-generation counterparts. No doubt, first-generation students are taking their place with other student populations in the community college who are worthy of increased understanding, attention and support.

It is expected that student diversity will continue to increase and student groups historically underrepresented in college will seek out higher education as a means to improve their life situation (Terenzini, Springer, Yaeger, Pascarella & Nora, 1996). College administrators must facilitate their entry into and integration with the college environment. It is logical that a student's initial experiences with the institution will profoundly influence this essential integration.

Theoretical Foundation

Vincent Tinto's (1993) interactional theory of student retention provided a solid theoretical base for this study. Tinto's theory is considered a major contribution in explaining student departure and persistence in higher education. His theory focuses on student interaction with the educational environment from a longitudinal perspective rather than a cross-sectional view. As such, it seeks to explain the processes that lead to individual student departure, rather than merely providing group data about given attributes.

Tinto (1987) viewed the foundation of departure at the individual and institutional levels. On the individual level, "intention" and "commitment" were seen as important variables that students bring upon entry to higher education. Those variables help define the borders of individual accomplishment and "color the character of individual experiences within the institution following entry" (p. 39). Pre-college characteristics, influenced by factors such as family background, previous education, and peer groups, all affect the subsequent formulation of goals and commitments. The institutional level is characterized by four forms of individual experience that influence student departure--adjustment, difficulty, incongruence, and isolation (Tinto, 1987). They describe important outcomes that result from a student's interaction within the institution.

Tinto suggested that college entry necessitates some degree of separation from the past in the form of previous associations and behaviors. Although this may entail a physical separation, in the case of a student who moves a significant distance away from home to attend college, it always involves social and intellectual separation. The ability to adjust and integrate is crucial for continuation in college.

According to Tinto, institutions of higher education are made up of distinct academic and social systems that have both formal and informal components. The formal structure of the academic system is what one would logically expect—the education of students via classrooms, laboratories, faculty lectures and other instructional activities. But, crucial to student persistence is informal academic integration, which is facilitated by such experiences as meaningful interactions with faculty outside the classroom and informal discussion and study groups. The formal social system, encompassing such

aspects as extracurricular activities, for example, is different than the more informal social system characterized by peer-group interactions.

A student's ability to interact with the academic system determines his/her academic integration. Likewise, interaction within the social system impacts social integration. Consequently, these interactions reformulate or reconstitute the student's intentions, goals, and commitments and, ultimately, the departure decision. Thus, persistence is a function of the student's interaction and integration with these systems. As a result, it is imperative that institutions study the effects that different programs and services have on students, especially those that are mandatory and that occur early in the student's experiences with the college.

Tinto's theory has its share of critics. Witte, Forbes, and Witte (2002) point out that Tinto's theory hinges on a student having a well-defined self-identity as he/she attempts to integrate into college life. The authors suggest this fails to sufficiently take into account the complexities of human development. Some researchers have suggested that the theory fails to take into account decision-making by the student about departing (Stage & Hossler, 2000), while others have seen the opposite in the theory, that it places too much emphasis on student decision control and thus conveniently leaves the institution blameless (Yorke, 1999). Still others have indicated that the theory does not sufficiently address the ramifications of cultural and ethnic diversity (Tierney, 2000; Rendon, Jalomo, & Nora, 2000). Tierney (1999) contended that, although Tinto's theory is based on assimilation, it does not take into account that for minority students this means the additional issue of cultural assimilation into primarily Caucasian institutions.

Entry-level assessment programs can have a major impact on the academic and social integration of students. At most community colleges, a major factor that impacts the initial academic integration of students is their performance on entry-level assessment. Students who do not perform well are usually required to take one or more remedial courses. These courses are not included in the requirements for a degree and, in many cases, cost more than college-level classes. In addition, since it is not usual for a student to take several remedial courses, the time for degree completion can be significantly lengthened. Financial burdens and increased time to degree completion are well-established attrition indicators (Tinto, 1987; Dervarics, 1997; Choy, 2000).

In addition, the entry-level assessment process can adversely impact a student's social integration. Students who are required to take remedial courses may feel embarrassed, inadequate, and begin to question whether they really belong in college. It is common to hear students refer to remedial courses as "dummy" classes.

Overall, administrators should seek to understand how the procedures and processes they mandate affect students. College personnel must know whom their students are, where they come from, and what cultural factors might influence the ability of students to successfully integrate into college life.

Related Concepts

London (1992) noted that in the early 1900s most college students were Caucasian, male, and from upper class or upper middle class families. The decades that followed evidenced progressive changes in science and industry, as well as other major transformations that created a significant merging of people and cultures. "As a result of

these and other changes, the contemporary student, statistically speaking, is no longer upper middle class, adolescent, or male; instead, the proportion of working-class and minority students has increased dramatically, older students are now commonplace, and women undergraduates now out number men" (London, 1992, p. 5).

As Tinto suggested, separation and integration are at the heart of the college going process for many historically underrepresented groups. Upon entry to higher education, they experience cultures that are, to some degree, in conflict with those of their friends and families. Rendon (1992) observed, "the academy is set up so that students most likely to succeed are those that can successfully disconnect from the past and turn over their loyalty to the conventions and practices of the academy" (p. 60). Lara (1992) described her own feelings of guilt for wanting to leave her family and Hispanic culture to pursue higher education. Once at college, she encountered an environment that devalued the capabilities of those from different ethnicities and cultures. Weis (1992) found that "different ethnicity, class, and gender groups have qualitatively different experiences in schools and that these groups exist in fundamental tension" (p. 14).

Referring to the sociological construct of "structural mobility," London (1992) noted that most first-generation community college students have grandparents who did not finish high school and, in many cases, parents who are not high school graduates. Most hold blue-collar or lower white-collar occupations. With advances in technology, and the resulting obsolescence of many jobs, it has become necessary for students to exceed the educational preparation of their ancestors in order to remain at the same socioeconomic level. In this regard, the community college has played a major role since

families of first-generation students are more likely to approve of this path of progression.

Rendon (1995) suggested that nontraditional first-generation students experience a disjuncture in the planned trajectory of their lives when they attend college. These students are breaking family traditions and experience difficult issues such as identity confusion, leaving their peer groups, separating from their families, and breaking sometimes subtle family codes of unity and loyalty. On campus, they are entering a foreign environment filled with confusing jargon, unknown policies and procedures, and various groups that at times convey less than welcoming messages. In short, these students find themselves caught between their former culture and the new campus culture to which they are trying to assimilate. London (1992) described this as a "leaving off" and a "taking on," the departure of one social identity and the acquiring of another (p. 8).

With the transformation in the demographic profiles of students expected to continue increasing the size and percentage of first-generation and other at-risk students (Terenzini, et al., 1996), it is imperative that educators identify processes to enhance individual student success. The identification of effective means of entry-level assessment and academic placement, which typically is attempted as students enter college, is a good place to start such a focus. It is speculated that most placement testing programs are currently administered without regard to potentially important cultural and demographic differences.

Statement of the Problem

Many variables contribute to the attrition and success rates of students. Institutions of higher education have an ethical responsibility to identify the programs and services that are effective in aiding first-year students in their adjustment to the rigors of the college environment (Sidle & McReynolds, 1999). Among the most popular tools chosen to help entering undergraduate students successfully transition to academic life on campus, and assist them in acquiring the various services and activities available to them, is an entry level assessment and academic placement program (Gardner, 1986). Tulsa Community College provides first-time entering student with such a program.

Tulsa Community College's assessment and placement program is designed to assist students with their transition into college. First-time entering students who have graduated from high school and who score below 19 on the ACT are mandated to take the CPT placement exam for math, English, and reading. In addition, any student who does not possess a high school diploma or a General Equivalency Degree (GED) must take the CPT. The program supports students and faculty by recognizing that a student's initial experience in college is critical in helping to determine academic, professional, and personal success. Such initial experiences can have a profound effect on the academic and social integration of students. Yet, data analysis indicates that approximately 60 percent of all new first year students leave Tulsa Community College at or before the conclusion of their first academic year (TCC Office of Institutional Research, 1999). Furthermore, a staggering 21.7 percent depart TCC at the end of the first semester (TCC Office of Institutional Research, 1999).

Entry-level assessment and placement programs are frequently mandatory for students. They are also one of the first experiences a new student has with the institution. Left unchecked, these programs can easily become impersonal and take on a student sorting function, a result especially concerning for public community colleges in that such an impersonal approach is incompatible with a welcoming, "open-door" philosophy and mission. Therefore, colleges should embrace an ethical responsibility to evaluate the effectiveness of the programs they mandate for entering college students.

Since its inception, the placement program at TCC has grown in participation each year, coinciding in a large part with increased numbers of under-prepared students matriculating into college. However, little empirical research has been performed to address the equity of the program in relation to the scores of women, ethnic minorities, low income and first-generation students who participate in placement testing.

Riehl (1994) suggested, "if first-generation students are significantly different from their peers in their academic preparation, aspirations, and achievement, it will be in the best interest of the University to tailor course placement, orientation, and advisement programs accordingly" (p. 16). This statement portends that a number of factors contribute to the high failure rates of first-generation students, and in many instances causes institutions to respond with a shotgun approach of services. The identification and specification of social demographic factors, which may be correlated with being a first-generation student and which may contribute to student failure, would be valuable in assisting colleges and universities in improving services.

Among the many studies that have examined factors affecting student success, a paucity of data exists on interactive effects of gender and ethnicity. Logically, students

who are at risk due to one socio-demographic factor may be even more disadvantaged based on combinations of factors. In addition, assessment research examining ethnicity, gender and socioeconomic status have focused on major national assessments typically used for admission to the university tier (Camara & Schmidt, 1999). Little is known about the impact the newer, computerized achievement tests have on various groups at the community college level.

The present study will investigate whether there are differences on entry-level achievement test scores between first-generation and second-generation students entering an urban, multi-campus community college. Further, the variables of household income level, gender, and ethnicity of the students will be examined. Possible interactive effects among the variables of gender and ethnicity will be studied.

Purpose of the Study

Placement testing, which emerged from seminars and other special activities designed to enhance the retention and success of first-year students, is a relatively recent phenomenon (Donald, 1997). Even with this recent emergence, the positive influences of such programs on student retention have been documented for over a decade (Pascarella, Terenzini, & Wolfle, 1986). Such studies, however, have focused largely on retention data on a macro level. Specific student characteristics, such as those examined by the current study, have not been sufficiently examined. Similarly, ethical issues related to culture and gender bias in the testing and placement process have been largely ignored.

The importance of reviewing current practices in a scientific manner cannot be overstated. Leafgren (1981) suggested, "We must not be afraid to evaluate what we are

doing. If we discover what we are doing is not relevant, then we are challenged to develop more effective procedures" (p. 3). Recently, discussions in student affairs literature (Barefoot, Fidler, Gardner, Moore, & Roberts, 1999; Shanley & Witten, 1990; Tinto, 1993) have emphasized the need for evaluation of practices to ascertain whether they are relevant and making a positive impact on students. There is a legitimate need to specify specific factors that may contribute to overall test scores. The identification of potential biases could prevent students from being placed in courses where they do not belong. This use of research methods as a practical means to improve practices is well documented (Donald, 1997).

Mandatory academic placement has become the rule in community colleges across the country. In Oklahoma, the Oklahoma State Regents for Higher Education mandate entry-level assessment and placement. Very little research has been performed to support the fairness of such practices with students of both genders, across various cultures, and with diverse family and personal backgrounds. It is entirely possible, and even probable, that academic placement test scores may be influenced by non-academic factors such as those explored in this study.

The purpose of this study was to determine whether the entry-level assessment process at the West Campus of Tulsa Community College differentially influences various student groups. The study will help create a foundation upon which future research can build. This foundation is crucial in that entry-level testing charts the academic path for students. Important outcome indicators, such as academic success, persistence, and degree attainment will follow and could be impacted by this initial

experience. The results of this study could provide empirical support for prominent and well-accepted practices, or could call such practices into question.

Significance of the Study

The importance underlying correct academic placement of entering college students has been generally accepted (e.g., Cohen & Jody, 1978; Claxton & Murrell, 1987; Upcraft, Gardner, & Associates, 1989). Although there have been many positive results, the effects of potentially significant variables, and possible interactive effects, have not been sufficiently explored in the overall context of student test scores. Variables such as those examined in this study have been shown to be critical in many areas of student development (Fox, Spooner, Utterback, & Barbieri, 1996; Utterback, Spooner, Barbieri, & Fox, 1995).

Shanley and Witten (1990) suggested that further research is needed to establish and clarify the effects of programs designed to assist freshmen. Understanding the influences such programs have on new students will enhance the ability of student personnel administrators to design programs to promote student adjustment and development. For placement programs to demonstrate levels of excellence, quantifiable data must be presented to support claims of effectiveness. The current study presents a research paradigm that is designed for easy replication at institutions with a broad range of student populations. In light of the increasingly limited resources available to college administrators, studies such as this, designed to ascertain factors related to the effectiveness of specific programs, are of paramount importance. Ketcheson and Levine

(1999) suggested that "assessment" and "evaluation" go hand-in-hand with planning and implementation.

Instrument

Beginning in 1991, with legislative approval to charge students up to a one-dollar per-credit-hour assessment fee, Oklahoma developed a statewide assessment plan designed to enhance student success (OSRHE, 2002). The plan required institutions to evaluate students at four key stages: entry-level and course placement; mid-level; program outcomes (exit level); and, assessment of student satisfaction.

Entry-level assessment was designed to gauge the basic skills achievement levels of incoming students so advisors could enroll them in appropriate courses thereby enhancing their chances of experiencing academic success. In the fall of 1994, the Oklahoma State Regents for Higher Education (OSRHE) specified the ACT as the primary test and required a score of 19 in English, mathematics, science, and reading in order for a student to take a college-level course in that particular discipline. Guidelines also allowed institutions to use an approved secondary instrument for students to demonstrate curricular proficiency. Tulsa Community College adopted a College Board product called Computerized Placement Tests (CPT) as its secondary test.

Although community colleges used various pencil and paper entry-level tests for some time, there has been a movement toward computerized adaptive testing in recent years. The CPT utilizes such an adaptive process in that the specific questions and their sequence vary from student to student (The College Board, 1997). Computer adaptive testing attempts to ensure that test questions, and the sequence of those questions, are

appropriate for a given examinee. Such tests usually administer an initial question of medium difficulty. If the student answers incorrectly, the computer program automatically "branches" to easier questions until the student answers correctly. The questions become progressively more difficult until the examinee begins answering incorrectly. This same branching process is used when the initial answer is correct with, of course, the subsequent question being more difficult. Thus, the questions are adapted to the capabilities of each student as indicated by the skill demonstrated on the previous question. In the end, testing time is reduced even though the test is un-timed. Students experience far fewer questions that are obviously too easy or too hard. Consequently, their level of boredom and frustration may be significantly reduced. They are constantly being challenged without being overwhelmed. As a result, a more accurate measure of a student's skill level is obtained through this adaptive process than through traditional testing means (The College Board, 1997). Two of the more popular computer-adaptive programs are the COMPASS by ACT, Inc. and The College Board's Computerized Placement Tests (CPT). This study will focus on students who took the CPT upon matriculation to Tulsa Community College.

The computerization of entry-level assessment has appeal for students and staff alike. The initial concern among administrators that examinees would find computer testing stressful or threatening has lessened due to a growing computer-savvy public. It has been suggested, however, this computer ease may not be experienced equally among all student groups (Wall, 2000). Computerized testing does have the benefit of producing real-time results. Scores are typically in the hands of students and advisors in a matter of minutes, or even seconds. In many cases, computer-bridging programs have been

developed which permit the scores to be automatically uploaded to the student's file on the college's student information system. Both the COMPASS by ACT, Inc. and The College Board's Computerized Placement Tests (CPT) offer institutions and their students this "real time" advantage.

In the fall of 1991, with the approval of the OSRHE, TCC began administering the CPT. Consistent with the intent of its developers, the CPT was used at TCC primarily by academic advisors to gauge students' current achievement levels and, thus, readiness for college-level work. This use is consistent with the CPT manual, which states the primary purpose of the tests is course placement; that is, to determine which courses are appropriate for students and whether remedial work is warranted (The College Board, 1997). At TCC, advisors guide students in score interpretation and course selection.

In the Reading Comprehension (RC) test of the CPT, students read passages and answer questions about the passage. Some questions are based merely on content while others ask about sentence relationships. Content categories include social sciences, natural and physical science, arts, and human relations. Questions can also be classified as to whether they relate to the main idea, secondary idea, inference or application.

The Sentence Skills (SS) questions are classified as either "sentence correction," in which the examinee must select the best word or phrase to substitute for the underlined part of a sentence, or "construction shift," in which the examinee must "rewrite" the sentence while maintaining the basic meaning of the original sentence. The Elementary Algebra (EA) test, covers operations with integers and rational numbers, algebraic expressions, and the solution of equations, inequalities, and word problems.

Three scores are calculated for each test of the CPT. The first is a "Total Right Score." Each test consists of questions drawn from a pool of 120 questions covering the appropriate range of difficulty and content. This score represents the number of questions the student would be expected to answer correctly if he/she were administered all 120 questions. The second score, the "Range," indicates the accuracy of the score. It can be viewed as a confidence interval, representing the student's total right score plus or minus one standard error of measurement (SEM). The last score is the "Percentile Rank" and compares a student's score to that of a representative sample of entering college students in a national assessment. The measurement used in this study was the "Total Right Score."

The CPT Manual presents data on the development of the CPT, as well as on its reliability and validity. The CPT is a highly consistent instrument. Test-Retest Reliability coefficients, from the 1985 College Board study, for each sub-test were Elementary Algebra (EA) = 0.96, Sentence Skills (SS) = 0.83, and Reading Comprehension (RC) = 0.90 (The College Board, 1997). These coefficients are well beyond what is needed for a quality instrument. According to Borg and Gall (1996), "correlations in the range of .20 to .40 may be all that we should expect to find for many of the relationships between variables studied by educational researchers" (p. 459).

The widespread use of the CPT among colleges speaks well for its face validity. Currently, 697 institutions use the CPT testing system (S. Murphy, personal communication, August 26, 2002). Specifications of the New Jersey College Basic Skills Placement Test (NJCBSPT) formed the basis of the content of the CPT tests. Advisory committees made up of subject area specialists from two-year and four-year institutions

developed the four NJCBSPT sub-tests. Items from the NJCBSPT, as well as similar items, were selected by Educational Testing Service (ETS) staff specialists.

Research Questions

This study investigated whether gender and ethnic differences existed in the Computerized Placement Test (CPT) scores of freshmen at the West Campus of Tulsa Community College (TCC). In addition, scores were compared between first-generation college students and their non-first-generation peers. Finally, scores were compared between students from low, middle, and upper income households. The research questions were:

1. Is there a difference in CPT achievement scores (elementary algebra, reading comprehension, and sentence skills) between first-generation and second-generation students that enter the West Campus of TCC?

2. Do differences in achievement as measured by CPT scores exist between males versus females at the TCC West Campus?

3. Do differences in achievement as measured by CPT scores exist among students of different ethnicities?

4. Are there statistical interactions among the independent variables of gender and ethnicity as measured by the CPT?

5. Are there differences in achievement scores as measured by the CPT among students from low, middle and upper income households?

Hypotheses

Utilizing freshman students entering the West Campus of TCC, an urban, multi-campus community college, the following null hypotheses were tested:

Ho1: There are no significant differences in achievement level scores as measured by the CPT of first-generation students versus their non-first generation peers.

Ho2: There are no significant differences in achievement as measured by CPT scores between males versus females.

Ho3: There are no significant differences in achievement as measured by CPT scores among students of different ethnicities.

Ho4: There are no significant interactions between achievement scores as measured by the CPT among the independent variables of gender and ethnic group classification.

Ho5: There are no significant differences in achievement scores as measured by the CPT among students from low, middle and upper income households.

Limitations of the Study

Five general areas limited the scope of this study. First, students were chosen from only one institution, the West Campus of Tulsa Community College. The service area of the TCC West Campus is unique in that the communities incorporated therein are predominately small, rural towns. It is likely and logical that the students entering the West Campus of TCC from this service area would be different in a number of ways from students entering other metropolitan community college campuses. Thus, the ability to generalize the results of the study to students at other institutions will be restricted. Studies incorporating students at institutions of varying sizes, with different missions, and in other regions would increase the otherwise restricted ability to generalize the results of this study.

Second, only students who scored below 19 on the ACT Assessment (ACT), as well as those who had not taken the ACT, were chosen for participation in this study. It is possible that different results would be found for persons who score 19 and above on the ACT. Therefore, generalizations must be restricted to populations that would be required to take placement exams under the criteria used in this study.

Third, although this study attempted to determine interactions only among the factors of gender and ethnicity, a number of other interactions may exist among the factors being studied. Further research would be required to determine possible influences of factors beyond the scope of the present study, as well as interactions among the remaining independent variables of family income levels and parental educational attainment.

Fourth, because the nature of this study was casual-comparative, cause and effect conclusions should be viewed with caution. The results could point in a direction suggesting the factors of ethnicity, gender, household income, and parental educational level have an effect on the placement scores of students, when no actual causal relationship exists. Studies employing randomization techniques might prove beneficial, but such experimental procedures can be difficult to achieve in an educational setting.

Finally, the small number of subjects within specific ethnic categories statistically limits this study. Larger cell sizes would have been preferable. In particular, a larger number of African American and Hispanic students would have allowed greater generalization of the results.

Definition of Terms

Academic Placement. Programs designed to assist students in achieving their full academic potential by placing students in courses with content that matches the students' academic preparedness.

First-Generation. For the purposes of this study, and consistent with U.S. Department of Education guidelines, first-generation students were those who did not have a parent who graduated from college with a bachelor's degree (Upward Bound Program, 34 CFR Ch. VI, p. 208).

Non-First-Generation. For the purposes of this study, "Non-First-Generation" was used synonymously with "Second-Generation."

Remedial Education. Courses designed to teach literacy—the basic skills of reading, writing, and arithmetic (Cohen & Brawer, 1989). More modern terms for "remedial" include "developmental" and "transitional."

Second-Generation. As defined by the U.S. Department of Education, second-generation college students were those students who had at least one parent who attained a bachelor's degree (Upward Bound Program, 34 CFR Ch. VI, p. 208; synonymous with "Non-First-Generation).

Traditional-Age College Student. Traditional-age college students were considered those who were 17-24 years of age (U.S. Census Bureau, 1998). Participants in the present study were traditional age students.

Definitions of Income Levels. Modeled after the ACT Assessment Application form, a CPT local question asked students to self-report their household income. Based on the categories available, Low Income was defined as a household income less than $24,000 per year. Middle Income was defined as household incomes of $24,000 to $50,000. Upper Income was defined as those who reported household incomes of $50,000 or more.

Summary

Proper academic placement is critical to the success of first-year students. Effective placement enables students to acquire the skills they need to successfully integrate and persist. This study will examine whether there are significant differences in levels of academic placement scores among students of various genders, ethnic categories, generation statuses, and household income levels. Important potential interactive effects of ethnicity and gender will also be measured.

If differences are found among the various demographic factors being measured, then broad implications exist for colleges and universities. First, there are questions regarding the cultural fairness of the tests. Colleges will be challenged to determine if students are being placed based on data that is not biased based on ethnicity, gender, or family background. Further, if identifiable factors were found to be associated with high placement into remedial courses (i.e., low CPT scores), then the need for early intervention programs, such as Upward Bound and Educational Talent Search for specific populations, would be strengthened.

If no difference in placement scores is found among the independent variables, this study will add to the body of knowledge regarding what may or may not be effective in preparing students for college. The placement program at TCC has not undergone rigorous empirical verification to establish its effectiveness with diverse and changing student populations. This study will help clarify external variables that affect the value of

the program. Adjustments to the program, its methods, and its overall goals can be discussed and revised in light of the type of information being explored in this study.

First-time students arrive on campus with differing academic backgrounds, intentions, and needs. This study is designed to examine factors relating to a program that was developed to address many of those needs. Comparing the placement scores of students from various demographic categories will provide valuable insights and may point to new directions for future inquiry and practice. This information will allow student affairs administrators to assess and evaluate whether placement programs are achieving their goals of placing students properly and fairly. The identification of specific interactive effects could help administrators in restructuring placement programs or even in targeting specialized curriculums to meet the academic needs of underrepresented groups. In large measure, the future development of higher education is contingent on enhanced equity and, as such, dependent upon this type of intermixing of academic and student affairs missions (Schroeder, Minor, & Tarkow, 1999).

CHAPTER II

REVIEW OF LITERATURE

This chapter will provide a discussion on both historical and current trends designed to facilitate the integration of new students into higher education. In addition, research literature pertinent to the student characteristics evaluated in this study--ethnicity, gender, income, and parental education--will be described. Finally, a review of the American community college, as well as a discussion on assessment and remedial education, will be presented.

The word "freshmen" has been around for the better part of five centuries, first appearing in the English language circa 1550. Initially used to describe anyone who was a novice in any field of endeavor, by 1590 first year students at an English university were being referred to as freshmen. During the next century, the term carried over to the American educational system and has been a fixture ever since (Dwyer, 1989).

Before 1900, most institutions of higher education in this country believed that they could deliver their curricula and values to all varieties of students (Dwyer, 1989). Shortly after 1900, however, university administrators were recognizing the need to serve freshman students in special ways. President Lowell of Harvard suggested that freshmen should be segregated into dormitories where advisors would also live to provide contact that is more individual. President Jordan of Stanford suggested in 1910 that freshmen needed special care, emphasizing the need for strengthening freshmen guidance (Dwyer,

1989). Among the earliest recognition was that special services could be provided to freshman students to help them be successful in college.

Over the course of the next three decades, an array of course offerings and specialized programs were developed to assist freshman students. Designed for individual campuses, but remarkable in their similarities, most of the courses concentrated on content designed to inform the students about their institutions and about college life in general. Many of the programs tried to assist students with thinking and studying. By 1930, approximately one-third of all institutions of higher education in this country offered some form of freshmen orientation courses. By 1938, nine out of ten freshmen were required to participate in such courses (Mueller, 1961). During the next decade, however, mandatory orientation courses were reduced because of faculty objections to offering credit for content that was of questionable academic value (Caple, 1964).

Freshman orientation courses had become greatly diminished in number and scope by the middle 1960s (Drake, 1966). During the next decade, however, there was a rebirth in the recognition of the needs of in-coming freshman (Dwyer, 1989). One of the factors contributing to this was the recognition that new students, many of whom were coming from families in which neither parent had earned a college degree, arrived on campus without the tools necessary to succeed in the college environment (Cohen & Jody, 1978). In addition, changes in the curricula, creating more opportunities for freshmen, made course selection much more complex and critical (Cohen & Jody, 1978).

The need for proper course placement was becoming the focus of attention. Freshman seminars and programs designed to be of academic assistance started to

develop (Gardner, 1986). The counseling focus from the past shifted to a general focus on academic topics including proper course selection and placement. Retaining students and having them continue enrollment after their first year of college became the focus of many programs (Gardner, 1986; Upcraft & Gardner, 1989).

The academic placement program at TCC supports these goals as well as many others. The objective of the program is to increase student success by properly placing under-prepared students into courses that will challenge them to increase their knowledge while not being so difficult that the students cannot be successful. By so doing, the program is designed to assist students in meeting their academic goals.

Demographic Characteristics

Ethnicity

American conviction holds that all people should have an equal opportunity for a quality education. "As Americans, we are raised to believe that social mobility, equal access to education, and a job for everyone is the cornerstone upon which our Nation was built" (Henriksen, 1995). The reality, of course, is that many Americans are without a meaningful job, live in poverty, and do not receive the same quality of education as those of greater affluence. As a result, it is incumbent upon educators to evaluate constantly how goals such as easy student access, a helpful entry experience, quality advisement, user-friendly policies and procedures, meaningful academic and social experiences, and a warm, welcoming climate are being met.

A national study of undergraduate enrollment in higher education from 1992 to 1997 by racial/ethnic background revealed important information about students who

attend various types of institutions (Phillippe & Patton, 2000). In 1992, minorities made up 25.4 percent of all enrollments at community colleges while Caucasians made up 70.6 percent. At four-year colleges, those rates were 21.3 percent and 73.5 percent respectively. By 1997, minority enrollment had risen to 30 percent at community colleges with Caucasian enrollments decreasing to 64.8 percent. At four-year institutions, the percentages were 24.4 and 69.6 percent respectively. Although the trend of increasing minority enrollment and decreasing Caucasian enrollment was true for both the two-year and four-year tiers, the change was most pronounced at the community college level. From 1992 to 1997, African American undergraduate headcount increased at the community college from 9.9 to 11.1 percent, whereas at the four-year colleges the increase was 9.5 to 10.4 percent. During this same time, Native American enrollment increased from 1.1 to 1.3 percent at the community college and 0.7 to 0.8 percent at four-year institutions. Hispanics realized the largest increases with a gain from 9.3 to 11.8 percent at the community college, and from 6.6 to 7.7 percent at the four-year tier. The American Association of Community Colleges pointed out that in urban community colleges minority enrollments reflect the overall minority population in the community (AACC, 2002).

National data is important, but caution should be exercised as it may not be reflective of state and local characteristics. For the 1999-2000 reporting year, the Oklahoma State Regents for Higher Education reported minority enrollments at the two-year tier in Oklahoma at just fewer than 25 percent (OSRHE, 2000). In contrast to the national picture, Native Americans had the highest minority enrollments overall at 9.2 percent. At the comprehensive tier, Native Americans were second, but only when a

category that grouped all Nonresident Aliens together was included. Native Americans led at both the regional and two-year colleges in Oklahoma, with African Americans having the second highest minority enrollment.

At the local level, fall 1999 reporting indicated that Tulsa Community College (TCC), the largest two-year college in Oklahoma, had the second highest African American community college enrollment next to Rose State College (OSRHE, 2001). However, TCC had by far the largest Native American enrollment at 929 students, with Oklahoma City Community College second at 520.

One major criticism of admissions testing is that it creates inequitable access to higher education, with certain minority groups being negatively impacted. It is widely known that score gaps exist between different racial and socioeconomic groups. Camara and Schmidt (1999) looked at ethnicity and socioeconomic factors as related to performance on widely used admissions tests. They also studied various outcome measures. They found consistent gaps between groups across tests. The largest gaps were between Caucasian and African-American groups, followed by Hispanics. Overall, Asian Americans did as well as Caucasians with the exception of the SAT I Verbal, in which they scored lower than Caucasians, and the GRE Quantitative, in which they scored higher. When socioeconomic status (SES) was factored in, all groups increased in test scores with increases in SES; however, major differences still existed between groups at each socioeconomic level.

Efforts to make the math assessments used in the 1996 National Assessment of Educational Progress (NAEP) less biased prompted the use of a variety of question formats, including constructed-response and performance-assessment instead of the

typical multiple-choice format. While 28 percent of Caucasian and 26 percent of Asian-American fourth-graders tested at or above the "proficient" level, only 8 percent of Hispanics and 6 percent of African-Americans tested at this level. Results were similar for eighth and twelfth graders (Reese, Miller, Mazzeo & Dossey, 1997).

Minority enrollments are increasing, especially at the community college tier. As such, it is imperative that college administrators examine their policies and practices to ensure fairness. A critical look at entry-level assessment is essential for achieving equity in the access and integration of minority students into higher education.

Gender

Early research on college student success largely ignored differences between the sexes. It has just been in the last two decades that the five-century-old discussions on college freshmen have begun to recognize the possibility of distinctions between the genders. Gilligan (1982) drew new awareness to possible disparities in a wide range of ways that males and females view the world. Subsequent researchers have cited numerous areas in which further research is needed to clarify gender differences (Greeley & Tinsley, 1988; Utterback, Spooner, Barbieri, & Fox, 1995).

Congressional calls for the study of gender equity in education prompted the development of the Women's Educational Equity Act, a provision of the Elementary and Secondary Education Act of 1965, amended in 1994. This legislation has prompted critical examinations of the "extent to which males and females have access to the same educational opportunities, avail themselves equally of these opportunities, perform at the same level, succeed at the same rate, and obtain the same benefits" (Bae, Choy, Geddes,

Sable, & Snyder, 2000, p. 2). Gender research is important, for one reason because educational differences between the sexes seem to begin early and are broad in scope. Bae et al. (2000) noted that grade school girls are less likely to have problems with behavior and schoolwork, and are less likely to repeat a grade. They are also less likely to be diagnosed as learning disabled.

Major testing initiatives, such as the National Assessment of Educational Progress (NAEP) administered to boys and girls at key stages throughout their public school experience, have typically found that females outperform males in writing and reading, but not in math and science (Bae et al., 2000). In keeping with their greater attainment on writing and reading tests, females are more likely to take Advanced Placement (AP) exams in English, and their scores tend to surpass their male counterparts (Bae et al., 2000). In addition, in accordance with their better performance on science and math achievement measures, males are more likely to take AP exams in science and math, and they score higher on those exams. There are indications these gaps are closing, especially for science. These testing disparities exist despite evidence that males and females take roughly the same rigor of courses in the later grades. What may be a crucial difference relates to attitude and self-concept. Specifically, females are less likely than males to report they like math and science and to think they are good at these subjects.

The impact of college admissions testing on gender is a highly debated topic. It is generally purported that such tests are used to predict students' grades during their first year ("FairTest," 2003). Although females have traditionally scored lower than males on the SAT and ACT (Williams, 2003; "Fair Test," 2003) they earn higher grades their first year of college. Although it would seem the predictive value of tests like the SAT would

be decimated by such findings, Barro (2001) still found strong predictive power for both genders, although he acknowledged an under-prediction for females. It has also been suggested that tests like the SAT are biased due to the format and construction used. Specifically, males are reported to benefit from tests that are multiple-choice, timed, and that reward guessing ("FairTest," 2003).

The gender difference on major college admissions tests is most pronounced on math and science. SAT results from 1999 indicated that females scored an average of 495 on Math, whereas males scored 531 (Williams, 2003). Similarly, ACT reported lower scores for females on the Math and Science Reasoning components, although composite scores were almost identical (Williams, 2003). In 2001, females averaged 35 points lower than males on the SAT Math section, but only 3 points lower on the Verbal component. It seems the test advantage females experience in verbal skills at a younger age is not evidenced when they take major college admissions tests.

One significant ramification of gender distinctions relative to subject matter and achievement scores is that since many of the higher paying occupations rely on strong math and/or science skills, women may experience fewer opportunities to land these highly skilled jobs. In an increasingly technological society, this is especially concerning. "For females to have the same opportunities as males in postsecondary education and the labor market, it is important for them to be equally well prepared academically" (Bae et al., 2000, p. 4).

Women have made notable gains in postsecondary education, although differences still exist. Currently, females are more likely than males to enroll in college immediately after high school, as well as to remain in college and receive a degree (Bae

et al., 2000). What seems to be a continued difference is choice of major. As one might predict from high school student research, men are more likely to major in science and engineering than women are. Moreover, although women have made tremendous strides in graduate school enrollment, from 39 percent in 1970 to 56 percent in 1996, they still lag behind in professional and doctoral programs, although this gap is narrowing fast.

To gain a clearer picture of gender equity in education, we must evaluate educational outcomes, with one of the most important and studied being the labor market. Although women have a lower rate of labor market participation overall, the gap narrows with increased education (Bae et al., 2000). Still, females in the workforce earn less than their male counterparts. Some of this may be due to differences in college major and, thus, eligibility for higher paying jobs. However, Bae et al. (2000) referenced data indicating a $4,000 starting salary differential for males and females that majored in business and management. This type of statistic seems indicative of a true gender bias.

Coley (2001), analyzing data from a variety of sources, examined gender differences within ethnic groups, a topic that has received scant attention. Regarding admissions tests, Coley found that males typically outperformed females regardless of ethnic group. This was the case on the SAT I Mathematics Test, GRE Verbal, Quantitative, and Analytic Tests, and the GMAT test. One exception was that African-American females outperformed African-American males on the SAT I Verbal Test.

Historically, males have completed college at a higher rate than females. This advantage going through the early 1970s ended by the early 1990s, and by 1998 there was a higher percentage of Caucasian, African-American, and Hispanic females who completed college than males.

Although male high school and college graduates in all ethnic categories earn more than their female counterparts, the gap is closing. Males in all ethnic groups are more likely than females to be employed, but that gap is decreasing also.

Coley (2001) concludes, "the nature of gender inequality in education is a complex phenomenon. There is neither a pattern of across-the-board male advantage nor a pattern of across-the-board female advantage...rather, the data support the more moderate view that these gender differences are complicated and that the nature of the difference or lack of difference depends on the type of outcome examined" (p.3).

In Oklahoma, fall 2000 enrollment data indicated more females (55.3%) enrolled in Oklahoma public college than males (44.7%; OSRHE, 2002). This was true for all ethnic groups except Asian-Americans and Nonresident Aliens. Some differences were especially noteworthy, with women making up over 59 percent of Native American enrollments, over 58 percent of African-American enrollments, and over 53 percent of Hispanic enrollments. Males comprised almost 63 percent of the Nonresident Alien enrollment.

This same pattern held at Tulsa Community College, although some ethnic gender differences were even more striking. African-American females made up 72 percent of African-American enrollments (OSRHE, 2002). Women comprised almost 62 percent of Native American enrollments. Moreover, Caucasian females outnumbered their male counterparts 59 to 41 percent.

Income

"For many lower income families in the United States, dreams of attaining an education after high school fade under the shadow of financial burdens" ("Poll," 2003). Without question, low-income students are at risk for attrition. Choy (2000) found that of students who enrolled in college in 1995-96, low-income students were much less likely to have graduated or still be enrolled in 1998. This was true even after controlling for various demographic factors (e.g., first-generation status, ethnicity, gender), as well as accepted persistence factors (e.g., delay after high school, hours worked, institution type, dependency status, etc.). Similarly, Evelyn (1998) found that high school students who had high admissions test scores but were from low-income families were less likely to attend college. Ninety-five percent of upper-income students with high test scores entered college, compared to 86 percent for middle-income students, with only 75 percent of low-income students going on to higher education. Although low-income students who took rigorous courses in math and science in high school were more likely to enter higher education than were those who did not take advanced courses, they were also less likely than upper-income students to take rigorous courses (Choy, 2000). Thus, early guidance about the proper courses to take and financial aid availability appear to be pivotal in the college-going decision process for low-income students.

There is little doubt that low-income students need significant financial support to attend college. Choy (2000), drawing on data from the 1995-96 National Postsecondary Student Aid Study, as well as some data from the Beginning Postsecondary Students Longitudinal Study of 1996-98, found that 26 percent of undergraduate students were

categorized as low income. To better understand who these students are and how they pay for their education, Choy analyzed their dependency, marital, and employment statuses. She found that almost half of all undergraduates could be categorized as "dependents," and the other half as either "independents without dependents" of their own or "independents with dependents." Relatively few (8 percent) of "dependents" were low-income, however, differences within this group proved interesting, with a higher percentage of low-income students being minority and first-generation students. Fifty-five percent of students whose parents had less than a high school diploma were low-income, compared to 12 percent of those who had at least one parent with some college experience.

Although not surprising, Choy (2000) found that the highest percentage of low income students were "independents with dependents" of their own, with 56 percent of single parents being low-income. "Independents without dependents" of their own were more likely to be low income if they were single and younger. Choy notes that older students, who are more likely to be married, have a larger earning capacity. Students who viewed themselves principally as a student instead of a worker, and those who attended full-time, were more likely to be low-income.

Results from a recent survey highlighted how important it is that lower income families receive financial aid information and guidance ("Poll," 2003). Although 60 percent of parents with household incomes less than $50,000 a year indicated they needed additional financial aid knowledge and advice, nearly half of those who make less than $25,000 a year said they had "no idea" where to find money for their children's college education.

The need for financial aid knowledge is even greater for minority families, with 62 percent of Hispanic-American parents and 66 percent of African-American parents indicating they need more information ("Poll," 2003). Overall, 86 percent of low-income, full-time students receive financial aid (Choy, 2000). Knowledge about financial assistance is key to enhancing equity in higher education, since the more students know about financial aid, the more likely they are to seek avenues to pay for, and subsequently attend, college.

Labor market outcomes clearly demonstrate how important it is for low income individuals to successfully complete a college education. Of those individuals 25 years or older with a baccalaureate degree, 80 percent were employed in 2000 compared to 65 percent with a high school diploma (Snyder & Hoffman, 2002). It is only logical that the higher paying and faster growing jobs go to those with college degrees. On average, those with a baccalaureate degree earned $15,000 a year more in 1998 than workers with only a high school diploma (Crosby, 2000). This disparity only widens with increases in college degree and age. What is somewhat surprising is that college graduates earn more than their non-degreed counterparts even in occupations that do not require a college degree. It is speculated that college graduates better qualify for promotions and are more likely to receive advanced training. In addition to higher salaries and benefits, Crosby found that college graduates have other advantages, such as less unemployment and not being forced to work a part-time job.

The impact of education on minority employment is profound. The year 2000 employment participation rate of African-Americans age 25 and over with a

baccalaureate degree was higher than the average for Caucasians (Snyder & Hoffman, 2002).

Low-income students are clearly at-risk. They are less likely to enter college even when sufficiently prepared. They possess less knowledge about the existence, acquisition and utilization of financial aid. They have multiple and sometimes conflicting obligations centered on family responsibilities and work requirements. When they are able to successfully enter and complete higher education, the labor market results for these graduates are very encouraging. What is not known is the relationship between student income and academic placement. In addition, the possibility of higher academic placements for students from middle and upper income families has not been specifically addressed. While Brown and Burkhardt (1999) reported that students who enrolled in at least one basic skills course during the freshman year were more likely than others to report low incomes, this study is typical in failing to address any possible relationship between higher incomes and higher preparation levels. Research of this type is essential to better understand the challenges faced by low-income students upon entry to college.

Parental Education Level

First-generation students and their family histories have received special attention by London (1989; 1992). His "Breaking Away" case study research (1989) examined how the social histories and psychodynamics of families impact the college-going of first-generation students, and how these students rectify, or fail to rectify, the often adverse obligations of family membership and educational advancement. Interestingly, several students reported that, although they generally felt out of place in the college

environment and did not want to draw attention to themselves, the interview topics provided them an opportunity to express their feelings on issues they could not talk about with their family or friends.

London (1989) concluded that family role assignment and separation dynamics were "at the center of the experience of many first-generation students" (p. 147). "Family role assignment" views the family structure from an emotional role point of view, with each member having different psychological responsibilities. How these role assignments are actualized has an impact on family member's behavior, emotions, and self-perception. Although they may be unconscious, signals about role assignments are transmitted in all families and tend to be associated with the history of the family. Stierlin (1974) suggested that such role assignments are produced primarily by parental needs and tend to be generational. "It is only when we see that mobility involves not just gain but loss....that we can begin to understand the attendant periods of confusion, conflict, isolation, and even anguish that first-generation students report" (London, 1989, p. 168).

The literature highlights several key distinctions between first-generation and non-first-generation students. First-generation students tend to be older (Terenzini et al., 1996; Choy, 2001), female (Nunez & Cuccaro-Alamin, 1998; Inman & Mayes, 1999) and have more dependents (Terenzini et al., 1996; Nunez & Cuccaro-Alamin, 1998). Inman and Mayes (1999) found that almost twice as many first-generation students reported having two or more dependents. While attending college, first-generation students work more hours in general, and work off-campus more than second-generation students do (Terenzini et al., 1996; Nunez & Cuccaro-Alamin, 1998). They are also more likely to

view themselves primarily as a worker and only secondarily as a student (Choy, 2001). They are more prone to attend part-time and, thus, complete fewer courses their first year (Terenzini et al., 1996; Nunez & Cuccaro-Alamin, 1998; Choy, 2001). And, first-generation students are more likely to be African-American or Hispanic, and from families with lower incomes (Choy, 2001). Nunez & Cuccaro-Alamin (1998) found that 23 percent of first-generation students had family incomes in the lowest quartile, but only 5 percent of second-generation students fit this category. Alternatively, 59 percent of second-generation students had family incomes in the highest quartile compared to only 18 percent for first-generation students.

Horn and Nunez (2000) found that as parents' educational level increased the likelihood that their children would enroll in college also increased. "The likelihood of enrolling in post-secondary education is strongly related to parents' education even when other factors are taken into account" (Choy, 2001, p. 7). In addition, whether individuals decide to enroll in college immediately after high school is strongly related to the educational attainment of their parents. Nunez and Cuccaro-Alamin (1998) found that first-generation students are more likely than second-generation students to delay entry into higher education following high school graduation (46 percent versus 19 percent respectively). Correspondingly, Choy (2001) reported that 82 percent of students who graduated from high school in 1999 and whose parents possessed a bachelor's degree enrolled directly after completing high school compared to 54 percent of those whose parents had only completed high school. And, for those whose parents did not finish high school, only 36 percent enrolled.

First-generation students appear to be less prepared for college than their second-generation counterparts. First-generation students are less likely to exceed the high school core curriculum (Warburton, Bugarin and Nunez, 2001), and they have lower high school grades (Riehl, 1994). They are less likely to take college admissions tests and, when they do, tend to score lower than non-first-generation students (Riehl, 1994; Choy, 2001). Warburton, Bugarin and Nunez (2001) found that 40 percent of first-generation students scored in the lowest quartile on the SAT or ACT, compared to only 15 percent of students whose parents were college graduates.

A growing amount of evidence points to the rigor of the high school curriculum as being a major determinant of collegiate entry and success for first-generation and other at-risk students. Warburton, Bugarin and Nunez (2001) found that college grade-point-average is closely associated with the rigor of high school courses taken. They found that students who took rigorous courses in high school were less likely to take remedial courses, and were more likely to persist in college. Of those students who entered a 4-year institution in 1995-96, 84 percent of those who exceeded the high school core were still enrolled in the spring of 1998, compared to 62 percent of those who did not exceed the core (Warburton, Bugarin, and Nunez, 2001). They found that 40 percent of first-generation students did not exceed the high school core curriculum. Although first-generation students were less likely than second-generation students to take a very rigorous curriculum in high school (9 percent versus 22 percent respectively), when they did their collegiate grade-point-average and persistence rates were similar to second-generation students (Warburton, Bugarin, and Nunez, 2001).

Parental expectations and support are different for first-generation students. Billison and Terry (1982) reported a tendency for parents of second-generation students to provide a wider range of support. First-generation college students perceived their parents to be emotionally supportive, whereas second-generation students perceived their parents to be emotionally and financially supportive, and willing to assist with such tasks as homework and transportation. Stage and Hossler (1989) found that the higher the educational attainments of the parents, the higher their educational expectations were for their children. For many second-generation students, whether to go to college or not has never been a question. These students "have assumed all along that going to college is what one does after completion of high school. College was simply the next, logical, expected, and desired stage in the passage toward personal and occupation achievement" (Terenzini, P., Rendon, L., Upcraft, M. L., Millar, S., Allison, K., Gregg, P., & Jalomo, R., 1994, p. 62). Going to college represents an expected continuation seated in family values and tradition. Overall, Terenzini et al. (1996) found that first-generation students experience less encouragement from their family to attend college. It is interesting that although first-generation students experience less family encouragement and support, they are more likely than second-generation students to report that living close to their parents and relatives is important to them (21 percent versus 14 percent respectively; Nunez & Cuccaro-Alamin, 1998).

Once enrolled in college, first-generation students experience less success compared to non-first-generation students. Riehl (1994) reported that first-generation students had a significantly lower expectation of the grade-point-average they would achieve, as well as lower academic degree aspirations. Similarly, Hellman (1996) found

that first-generation students had a lower self-perception of their academic ability. They also tended to have less persistence and degree completion (Riehl, 1994; Nunez & Cuccaro-Alamin, 1998). Choy (2001) found that first-generation students were twice as likely to not return for the second year. Overall, goal attainment is less likely for first-generation students even after controlling for other relevant factors, such as age, gender, ethnicity, income, enrollment status, institutional tier, and academic and social integration (Choy, 2001). "In other words, first-generation status appears to be a disadvantage throughout postsecondary education that is independent of other background and enrollment factors" (p. 26). The importance of helping first-generation students succeed cannot be overstated. As with other at-risk populations, first-generation students who persist and graduate do as well as others in regard to occupational and salary attainment (Nunez, 1998; Choy, 2001).

First-generation students are more likely than their non-first-generation counterparts to enroll in a community college (Choy, 2001; Inman & Mayes, 1999). Nunez and Cuccaro-Alamin (1998) reported that 51 percent of first-generation students enrolled in community colleges versus 37 percent of their second-generation peers. Inman and Mayes (1999) found that first-generation students are more likely to select a community college due to geographical restrictions. They reported a greater need to stay at home, find a college close to home, and take evening courses. In addition, when asked what educational path they would take if the community college were not available, only 46 percent of first-generation students said they would attend a state university, compared to over 61 percent of second-generation students. "These data suggest that the community college is the primary or only postsecondary opportunity for many students"

(Inman & Mayes, 1999, p.5). Choy (2001) found that of students who entered a community college with the goal of a certificate or associate degree, first-generation students were as likely as their counterparts to persist and reach their goals. However, this was not true for students who had a goal of transferring and earning a bachelor's degree, although taking a rigorous high school curriculum helped close the gap.

Nunez (1998) pointed out that academic and social integration play a major role in postsecondary outcomes. A student's ability to adapt is essential. "Poor academic preparation, family responsibilities, and full-time work, for instance, can pose severe challenges to a student's ability to integrate into postsecondary institutional life" (p.2). Several factors appear to inhibit the social and academic integration of first-generation students into higher education. Terenzini et al. (1996) found that first-generation students experienced less socialization with their peers while in high school, and spent less time talking with teachers. This could have a carryover effect to higher education. It certainly seems logical that integration would be diminished for first-generation students by the fact they are more likely to delay entry after high school graduation, work off campus, work more hours, attend part-time, have more dependents, and are less likely to live on campus (Nunez & Cuccaro-Alamin, 1998). When comparing institutional tiers, Nunez (1998) found that first-generation students attending public, two-year colleges had lower levels than did their non-first generation counterparts in both academic and social integration.

Most first-generation students enter higher education at the community college tier in the U.S. (London, 1992; Richardson & Skinner, 1992; Rendon, 1995). According to the National Center for Education Statistics, 60 percent of public community college

students are first-generation. In addition, in their report "Faces of the Future: A Portrait of America's Community College Students," Phillippe and Valiga (2000) describe the results of a national survey conducted in the fall of 1999 by The American Association of Community Colleges (AACC) and American College Testing, Inc. (ACT). More than half of the 100,000 students at 245 community colleges in 41 states included in the survey were first-generation. Consequently, it is imperative to understand the higher education environment in which these students find themselves.

The Community College

The community college is a uniquely American phenomenon having its roots in the early part of the twentieth century. Cohen and Brawer (1989) point out several social forces that contributed to its development, such as the expanding industrial base of the country and the need for skilled workers, and the push for social equity that would be facilitated by increased access to college. It was an era of expanding scientific knowledge and new technologies. A focus on individual and societal upward movement was paramount. Knowledge for sake of knowledge was not as important as how that knowledge could benefit the individual or society in a more direct manner. There was a growing belief that education solved ills, so the more schools and the more years of schooling the better for all. "The community colleges thrived on the new responsibilities, grown large because the colleges had no traditions to defend, no alumni to question their role, no autonomous professional staff to be moved aside, no statements of philosophy that would militate against their taking on responsibility for everything" (Cohen & Brawer, 1989, p. 3).

In order to grasp fully the development of the community college, one must understand the overall development of higher education during the twentieth century. As the number of students attending and graduating from secondary schools grew at a fast pace, the necessity for higher education increased as well. In 1924, 30 percent of the school age population graduated from high school. By 1960, 75 percent graduated and 60 percent of these graduates entered college the next academic year (Cohen & Brawer, 1989). Although the demand for higher education magnified, it was not a unanimous conclusion that community colleges were needed to handle the influx. It was suggested that the universities could be expanded and still accommodate the additional load. However, some educational leaders disagreed and felt the real issue was not whether facilities could be expanded and staffs increased, but whether the universities should be teaching lower division at all. This was, after all, the age of knowledge development, not just the passing on of existing information. Many university leaders and advocates saw community colleges as a vehicle for relieving themselves of the burden of non-scholarly pursuits. Some even suggested that instead of community colleges, secondary schools should be expanded to the thirteenth and fourteenth years.

Cohen and Brawer (1989) outline several pros and cons regarding the manner in which the community college developed. Many university professors strongly supported the community college concept, but their motivation may have been rather self-serving. They wanted a buffer that would deal with under-prepared students and, thus, allow only the brightest to attend the university. Community colleges embraced the challenge of serving student populations not welcomed by the universities. These students included: "those who could not afford the tuition; who could not take the time to attend a college

on a full-time basis; whose ethnic background had constrained them from participating; who had inadequate preparation in the lower schools; whose educational progress had been interrupted by some temporary condition; who had become obsolete in their jobs or had never been trained to work at any job; who needed a connection to obtain a job; who had been confined in prisons, physically handicapped, or otherwise unable to attend classes on a campus; or who were faced with increased leisure time" (Cohen & Brawer, 1989, p.22).

In short, community colleges served disenfranchised populations and gave them what they needed and wanted. Community colleges granted access to higher education. Planners ensured that community colleges were strategically located so students could commute from work and home, that courses were offered at convenient times including evenings and weekends, that alternative course delivery methods were used, and that an open admission policy was in place to guarantee access to all.

Nettles and Millett (2002) suggested that "one of the most important innovations for higher education in the 20th century has been the establishment of two-year community colleges" (p.1). In general, almost all community colleges have a mission founded on the following key components: providing technical/occupation training that leads to a terminal associate degree for those wanting to enter the workforce upon graduation; transfer programs for students wanting to complete the first two years of a baccalaureate degree; developmental or remedial education designed to assist under prepared students for college level work; continuing education courses for those wanting personal and/or occupational enrichment via a non-credit format; corporate and contract

training to meet unique needs of business and industry; and, community service that takes many varied forms.

A cornerstone of the community college has been to provide access to postsecondary education, especially for populations historically underrepresented in higher education. Minority students constitute 6-8 percent of higher education students, but represent almost 60 percent of community college students (Nora, 2002). Of all African American and Hispanic students who enroll in college immediately following high school graduation, more than 50 percent attend community colleges (Nora, 2002). It should be noted that states with large minority populations, such as California, Arizona, Texas, and Florida, also have well-developed community college systems.

Analyzing 1996-1997 data, the National Community College Snapshot (AACC, 2002) reported that over 1,130 community colleges served 10.4 million students in the fall of 1997, accounting for 44 percent of all undergraduates and 46 percent of all first-time entering students. During this semester, community colleges enrolled 46 percent of all African-American students, 55 percent of all Hispanics, 46 percent of all Asian/Pacific Islanders, and 55 percent of all Native-American students. Fifty-eight percent of the students were female. The report also indicated that 48 percent of community colleges participated in welfare-to-work initiatives.

The growth of community colleges has been astounding. Examining a 20-year span from 1976 to 1996, Nettles and Millett (2002) found that part-time enrollment at community colleges increased over 60 percent and full-time enrollment grew over 25 percent. By comparison, undergraduate enrollment at four-year institutions increased 24 percent and 17.5 percent respectively. During this period, part-time enrollment of Asian

students increased at community colleges by over 357 percent, Hispanic enrollment by almost 263 percent, and African American enrollment by over 85 percent. Minority enrollment at four-year universities also increased, but at a lower rate. This same trend held for full-time enrollment. Enrollment of women also made tremendous strides during this time. Part-time female enrollment at community colleges increased almost 83 percent and full-time enrollment over 53 percent. At the four-year tier, female increases were 43 percent and 35.5 percent respectively. Nettles and Millett concluded, "community colleges have provided greater access for students than any other sector of higher education" (2002, p.1).

Examining diversity among community college students highlights the challenges faced by faculty and administrators in meeting the needs of a very complex student body. AACC and ACT collaborated to administer a survey during fall 1999 and fall 2000 to students at over 300 community colleges (VanDerLinden, 2002). This research initiative resulted in the first and second comprehensive "Faces of the Future" reports. VanDerLinden (2002), analyzing data from both years, found that students were attending for a variety of purposes. These purposes were grouped into clusters. A few comparisons between students who were attending primarily to plan for a future career (i.e., "Career Preparation") versus those attending to prepare for transfer to a four-year university (i.e., "Transfer Only") can serve to highlight the diversity among students attending community colleges. Whereas 58 percent of Career Preparation students were under 25 years of age, 86 percent of Transfer Only students were in this age category. Ninety percent of Career Preparation students indicated that increasing salary potential was a major or moderate reason for enrolling. Transfer Only students did not indicate

current employment issues as a reason for their enrollment. Thirty-nine percent of Career Preparation students reported living with their parents, while 86 percent of Transfer Only students lived with their parents. Moreover, while over 50 percent of Transfer Only students said parental income was a major or moderate source of college funding; only 30 percent of Career Preparation students indicated this means and level of support. These two clusters highlight one example of the diversity among community college students.

People who seek educational services at community colleges have a variety of goals and notably diverse backgrounds. "Although it may be convenient for institutions and policymakers to categorize students according to the different missions of the community college, students rarely fit neatly into the framework of an occupational, academic, or lifelong learning track. Students may be using the community college to fulfill many goals simultaneously, and their reasons for attending a community college may be complex" (VanDerLinden, 2002, p. 2). Understanding diversities among community college students is essential if administrators are going to be able to plan and develop programs and services to meet their students' needs.

Despite tremendous growth in the number of community colleges and students they serve, Nettles and Millett (2002) also point out that the degree attainment and transfer rates of community college students seem to be low. They note that only 17.7 percent of students entering in 1989-90 had received an associate degree by 1994. What the authors do not address, and what may be an important research consideration, is the number of students who had an original and sustained intent to earn the degree. The fact that students attend community colleges for a wide variety of reasons makes some community college research findings questionable, since obtaining and updating

information regarding student goal intent seems haphazard at many colleges. This makes efforts to gauge accurately retention and overall student success difficult and frequently inaccurate.

Community college students vary considerably in their English, reading, and mathematics achievement levels upon entry. Community colleges have long placed an importance on providing first-time entering students with a solid basic skills assessment and course placement program. Such programs assist students and their academic advisors in identifying the appropriate levels of courses in which students should start in a certain area. That is, such measures are intended to indicate whether remedial work is needed. While it is hoped that these programs give students their best chance of experiencing academic success, critics have suggested that more needs to be done to verify the value of these rapidly expanding testing and placement programs (Utterback, 1998).

Assessment

Assessment initiatives have dramatically increased in higher education (Cress, 1996). Public and legislative calls for increased accountability have prompted state coordinating and institutional governing boards to implement various assessment measures to better demonstrate institutional viability. Such efforts have frequently encountered resistance from faculty and administrators. As Astin (1991) notes, "Among proponents of equal access and expanding opportunities in higher education, there are few issues that generate as much heat as testing and assessment" (p. 194).

In October 1989, the North Central Association (NCA) Commission on Institutions of Higher Education adopted a "Statement on Assessment and Student Academic Achievement" that became part of their criteria for accreditation (Thrash, 1990). With this statement, NCA made clear that assessment would be a crucial component of institutional evaluation. "Our expectation is that an institution has and is able to describe a program by which it documents student academic achievement" (Thrash, 1990, p. 387).

Following NCA's lead, the Oklahoma State Regents for Higher Education (OSRHE) developed their "Policy Statement on the Assessment of Students for Purposes of Instructional Improvement and State System Accountability" (OSRHE, 1996, p. II-2-117). With legislative approval to charge students up to a one-dollar-per-credit hour assessment fee, the OSRHE developed a statewide assessment plan designed to enhance student success. The plan required institutions to evaluate students at four key stages: entry-level and course placement; mid-level; program outcomes (exit level); and, assessment of student satisfaction. Most applicable to the present study, the Regents stated that "each institution will develop criteria, subject to State Regents' approval, for the evaluation of students at college entry to determine academic preparation and course placement" (OSRHE, 1996, p. II-2-118). As Astin (1991) projected, "It is very difficult, if not impossible, to learn how our educational policies and practices affect student outcomes in the absence of input data on the entering student" (p. 64).

Although some researchers have found less than encouraging results when analyzing the relationship between test scores and course success, usually measured by end-of-course grade, there have been studies that support the entry-level assessment and

placement concept. Gordon (1999) concluded, "course placement has been determined by most researchers to be one of the major keys to student retention, persistence, and success" (p. 3). A study at St. Louis Community College demonstrated a significant relationship between students' CPT Sentence Skills scores and success in entry-level writing courses (Saunders, 2000). Although not considered conclusive, a statistically significant relationship between entry-level test results, course placement and grade-point-average (GPA) was found in a study conducted at Terra State Community College in Ohio (Gamble, 1994). Others have cautioned against using course grades as the criterion for the validity of tests or placement criteria due to substantial variations in instructor grading (Armstrong, 2001).

A Florida state mandate, effective July 1, 1997, raised the CPT cutoff scores for students entering remedial and entry-level courses at Miami Dade Community College. For most courses, this change resulted in increased student performance (Bashford, 1998). Curtis (2000) found similar results at Germanna Community College in Virginia. Studies such as these, where cutoff scores are changed and there is a resulting direct change in student success, seem to be a powerful indicator of the impact and justifiability of entry-level assessment and placement.

There is mounting evidence that an academic advisement system where advisors use several indicators in combination with test scores provides the most accurate placement and resulting student success in courses. Community colleges in California are now required to use "multiple measures" for course placement instead of test scores alone (Gordon, 1999). Yuba College utilizes a computer program that takes into account select student historical and behavioral characteristics, combined with CPT scores, to

generate placement decisions. Gordon reported that this model has been successful stating, "...students succeeded in their initial placement courses at a higher rate as a result of computerized multiple measures placement" (p. 7).

Some authors have voiced concern about computerized testing and potential disparity along gender, ethnic, and income lines. "That females, persons of color, or individual from different ethnic backgrounds may be disadvantaged in certain testing situations has been a long-standing concern in paper/pencil testing. This can be exacerbated with tests delivered via computer or the Internet. If a particular group has disproportionate access to computers and technology, disparity could be created by the medium alone" (Wall, 2000, p. 4). A sound entry-level assessment and course placement program is crucial, especially for at-risk students because, as Gordon (1999) pointed out, "students who succeed in their initial courses are more likely to persist" (p. 3).

Remedial Education

Remedial education, also referred to as "compensatory," "developmental," and "transitional" education, has historically been part of the community college mission. "Community colleges have long been proponents of open access to higher education regardless of academic preparation. Due to this open-door policy, community colleges have frequently served students deemed insufficiently prepared for college-level courses" (Shults, 2000, p.2).

A recent study conducted by the American Association of Community Colleges (AACC) examined the role and scope of remedial education in community colleges (Shults, 2000). Over 90 percent of surveyed colleges offered remedial courses in math,

reading, and writing; however, fewer than half had courses in science, adult basic education (ABE), and English as a second language (ESL). Fifty-eight percent of institutions mandated entry-level assessment for entering students. Seventy-five percent of these colleges specified course placement based on the test scores. Sixty-three percent utilized computerized assessment instruments. In addition, 83 percent of colleges permitted students to retest, but most limited the number of retakes to one or two. Seventy-seven percent of colleges determined their own cutoff scores, whereas 23 percent utilized state mandated cutoffs. Shults concluded, "assessment and placement of students into remedial courses is one of the most debated aspects of remedial education" (2000, p. 4).

The AACC study found that institutions varied tremendously on many relevant indicators (Shults, 2000). Regarding the percentage of students enrolled in remedial courses, institutional responses ranged from 1 to 80 percent, although most reported around 20 percent of their total student population. There was some geographic uniqueness, with large cities and the southwest part of the country reporting that at least 27 percent enrolled in a remedial class. Of students who were new to higher education, more than 36 percent were enrolled in remedial education at more than half of the colleges. Geographically, the Mid East had the largest percentage with over 46 percent. In their "Annual Student Assessment Report," the Oklahoma State Regents for Higher Education (2002) noted that 41 percent of students entering community colleges nationally demonstrated a need for remediation in at least one of the foundation skills. Of those students, 62 percent had insufficient math skills.

Shults (2000) found that the manner in which institutions developed, organized, and offered remedial courses was remarkably similar. Most colleges offered remedial courses through the applicable academic area, such as remedial math courses offered through the math department, rather than a department specific for developmental courses. Most had multiple levels of remedial courses, usually at least three levels of math and two levels of reading and writing. Most gave institutional credit, where the course and grade would appear on the student's transcript and count in financial aid calculations, but would not satisfy degree requirements. Sixty-five percent of institutions indicated they place limits on class enrollments and, of these, 73 percent specifically addressed the class size of remedial courses. Forty-five percent of colleges offered self-paced options for remedial work. Moreover, 26 percent provided a distance education option (Shults, 2000).

On the state level, Oklahoma data for the 2000-2001 academic year revealed that 35,378 students were enrolled in remedial courses, with almost 76 percent of that number at two-year colleges (Annual Student Assessment Report, OSRHE, 2002). Of first-time freshman in the fall of 2000 who completed the high school core curriculum, 25 percent enrolled in remedial courses, compared to 51 percent for those who did not complete the high school core. Almost 32 percent of fall 2000 freshman enrolled in at least one remedial math course, with remedial English being second at 13.7 percent. The OSRHE (2002) concluded, "...two-year colleges continue to be the primary source of remediation in the State System...The higher education levels achieved by students, with the aid of remediation, have direct societal and economic benefits, while the consequences of a

growing under-educated populace result in a cycle of poverty and wasted potential" (p. iv).

Summary

Demographic characteristics of college freshman are changing dramatically. In recent years, researchers have begun focusing attention on ethnicity and gender as key elements in student development. In addition, researchers have identified a number of educational attainment issues related to whether a student's parents received a college degree, and the related issue of household income. None of the research to date, however, has sought to study all of these elements in a comprehensive manner.

Attention on the success of college freshman has shifted from interpersonal relationship building, to focusing on academic preparedness and student persistence. With rapidly changing demographics, the identification and delineation of factors relating to academic preparation are increasingly important. The potential positive effects of this type of research on academic success and retention could be quite significant.

Cantor (1995) pointed out that students continue to often be seen as "empty vessels" with the role of instructors being to fill them with knowledge. The goal of academic placement programs is similar to that of freshman year experience courses. That is, the goal is to create a positive attitude toward higher education and a specific institution in particular, and to set the stage for student success (Upcraft & Gardner, 1989). TCC is no exception in pursuit of this goal. Its placement program, like many others, is carefully designed to provide accurate information on any given student's readiness in several academic arenas. The next logical step in the development of this

program is the identification of factors that may influence student readiness as they attempt to enter college.

Faculty and staff at TCC work together to place students in courses that will simultaneously challenge them, while also enable them to succeed in their academic pursuits. The goal is to fairly and effectively place students so they can achieve academic success.

The present study is needed to further the knowledge in the field of academic placement. Utilizing specific student demographic information in course placement, and ultimately in course design and re-design, represents a major step forward in academic placement. The study of factors which may contribute to academic readiness will further the broad knowledge of the academy in an important procedural area.

The specification of factors contributing to student placement is lacking and needed. Donald (1997) noted, "assessment procedures and indicators at program and institutional levels have commonly been developed in response to external demands that institutions be accountable or meet certain standards. The positive effect is that institutions are enjoined to broaden their perspective, to become aware of their own governance procedures, and to compare themselves with benchmark institutions and practices" (p. 226).

The factors studied in this project are important and appear to be inter-related. In one study of 1992 graduates, students whose parents had not gone to college were significantly more likely to be black or Hispanic and from low-income families (Horn & Nunez, 2000). In addition, first-generation students have been shown to be more likely to be female, married, and have more dependent children (Brown & Burkhardt, 1999). This

led Choy (2001) to conclude that "policies or programs that increase access for students whose parents did not go to college may also do the same for low-income and minority students" (p. 6).

The benchmarking of factors relating to academic preparation is important for future program planning. While the needs of first-generation students have been documented, research needs to go beyond this classification to investigate underlying contributing factors. Brown and Burkhardt (1999) suggested, "general descriptive statistics do not offer insight into the underlying causal factors associated with differences between first-generation students and others. While research has demonstrated that first-generation students differ somewhat from other students on various measures of academic success, it is often erroneously inferred that first-generation status caused such differences" (p. 21). The factors of a student's gender, ethnicity, and household income level will be examined in addition to level of parental educational attainment as related to academic preparation.

CHAPTER III

DESIGN AND PROCEDURES

Introduction

The importance of the types of programs being examined in this study on student success is well-documented (Schroeder, Minor, Tarkow, 1999). Colleges and universities can have very positive effects on students by assisting them in making smooth transitions to college (Fidler & Hunter, 1989). Intrusive, directive programs, such as entry-level assessment and placement and freshman seminar initiatives, have been shown to have a wide range of positive impacts on freshmen students. Sidle & McReynolds (1999) concluded "studies confirm that students who enrolled in freshman-year experience courses tend to complete more credit hours, earn higher cumulative grade point averages, and return to the institutions at higher rates than students who did not enroll in such first-term courses" (p. 289). Direct research that considers key student traits, such as gender, ethnicity, income and parental education as related to the effective placement of students into college courses would substantially contribute to the existing knowledge in this important field.

The current quantitative, causal-comparative study was designed to extend the base of information available from existing research related to student placement. This study intended to ascertain whether students who participate in the placement program at Tulsa Community College West Campus have placement scores that are significantly

influenced by a variety of demographic characteristics. In addition, possible interactive effects of gender and ethnicity were tested.

In this study, the independent variables were gender, household income, first and second-generation status and ethnic group. The dependent variables were placement scores as measured by the Sentence Skills (SS), Reading Comprehension (RC) and Elementary Algebra (EA) sub-tests of the CPT. The significance level for this study was set at alpha = .05. The data were collected from the best available data in the CPT data system at TCC West Campus.

Subject Selection

The Tulsa Community College West Campus, located in Tulsa, Oklahoma, has an enrollment of approximately 2,000 students per regular term. Approximately 500 students are enrolled as incoming freshmen each fall and spring semester. Sixty-five percent of the first-time students are female and 35 percent are male. Roughly, 80 percent of the first-time freshmen are Caucasian.

The subjects for this study were first-time college students who initiated their college process since the summer semester 1997 at the Tulsa Community College West Campus. This study employed a *purposive sample* of subjects consisting of incoming students who took the CPT exam for placement purposes. Gay (1996) indicated that this type of sampling is appropriate in that "the sample is selected purposefully, i.e., precisely because it is believed to be a rich source of the data of interest" (pp. 213-214). Data were separated based on gender and the ethnic classifications of "Caucasian," "African American," "Hispanic," "Native American," and "Other." Student data was also

separated and compared based on status as a "first-generation" college student as compared to their non first-generation counterparts. Household income data was broken into three categories of "Low Income," "Middle Income," and "Upper Income."

It is important to note that students, who have previously attended college, whether at TCC or another institution, are not required to take the CPT. In addition, since there are instances in which a student may have taken the CPT more than once, only the first test administration, as determined by the earliest test date, was included in this study. Thus, it can be concluded that only the initial test administration of first-time entering college students was included in this study. Any student who did not complete all of the demographic questions necessary for this study was eliminated from the study pool. Based on the above listed parameters, the sample for this study included 551 student records from a pool of 1,547 students tested. Student data were historical and, therefore, data collection was non-intrusive to students.

Procedure

An electronic search of student records was conducted in order to identify those first-year students who have utilized the placement program at Tulsa Community College prior to the summer semester 1999. A study sample of 551 of these students was selected for participation in the study. CPT scores were compared in order to address the research questions and corresponding hypotheses proposed in this study.

A pool of possible participants for the current study involved 1,547 first-time entering college students who took the Computerized Placement Test (CPT) at the West Campus of Tulsa Community College (TCC) from April 1997 through April 1999. This

timeframe was significant because the month of April was when enrollment for the subsequent academic year began—specifically the summer and fall terms. In addition, in April of 1997, several local background questions were added to the CPT process to help the College determine additional student socioeconomic and demographic characteristics.

Two of the background questions, which asked participants to identify the highest educational level completed by their father and mother, identified first-generation students. Response categories included: (0) grade school or less; (1) some high school; (2) high school diploma or equivalent; (3) business or trade school; (4) some college; (5) associate degree; (6) bachelor's degree; (7) some graduate or professional school; (8) completed graduate or professional school; and (9) omit. Students who indicated the highest educational levels of their mother and father were contained in categories 0, 1, 2, 3, 4, or 5 were classified as a first-generation student. Likewise, participants who reported either parent(s) highest education level completed included 6, 7, or 8 were classified as second-generation students.

As mentioned, eight local questions were added in 1997. One local question important to this study asked about the student's household yearly income. Based on the students' self reports, the students were classified as either "Low Income," "Middle Income," or "Upper Income."

As stated, those students with multiple test records, as well as any student who did not complete all of the demographic questions necessary for this study, were eliminated from the study pool. The final study pool included 551 students.

From April 1997 through April 1999, first-time college students entering the West Campus of Tulsa Community College were administered the CPT prior to their initial

academic advisement session. After answering several background questions, students were administered CPT test components on writing, reading, and mathematics.

Data Analysis

Explored in the current study was whether differences existed in CPT sub-test scores of students at Tulsa Community College by ethnicity, gender, first-generation status, and household income levels. One-way ANOVA's were performed based on first-generation status, gender, ethnicity, and household income levels. A 2 x 5 (gender by ethnicity) factorial analysis of variance was utilized to ascertain interactive effects among the independent variables of gender and ethnicity. An alpha level of .05 was used for all hypotheses testing in this study.

These analyses were performed for each of the three dependent measurement domains (i.e., dependent variables of Sentence Skills scores, Reading Comprehension scores, and Elementary Algebra scores). There were two levels of generation status (i.e., first-generation and non-first-generation), two levels of gender (i.e., male and female), three levels of income (i.e., low, middle, and upper), and five levels of ethnicity (i.e., Caucasian, African American, Native American, Hispanic, and Other).

The CPT measures three separate domains. Independent ANOVAs were used for that reason and, consistent with this rationale, because academic advisors do not use CPT test scores in combination to advise students. That is, in practice, a student is placed into a writing course based upon his/her CPT Sentence Skills score, not Sentence Skills combined with Elementary Algebra.

CHAPTER IV

RESULTS

This chapter presents a description of the subjects as well as the detailed results of the study. Specific data are presented in table form for each hypothesis. A clarification is provided of the types of analyses for each hypothesis. The alpha probability level to reject the null hypotheses was set at .05.

Where appropriate, a series of post hoc comparisons were performed to determine if significant differences existed among groups. Fisher's Protected Least Significant Difference (PLSD) was used for comparison. Fisher's PLSD, a liberal test that is likely to find differences if they exist, was an appropriate post hoc test due to the investigative nature of this study.

Characteristics of Subjects

The subjects of this study were 551 students from TCC West Campus who enrolled and were tested prior to the summer of 1999. Table 1 presents descriptive statistics on the sample of subjects. As seen in Table 1, the gender makeup of the subjects consisted of 335 female and 216 male students. There were 436 First-Generation students compared to only 115 Second-Generation students. The subject populations consisted of 82 Native Americans, 21 African Americans, 15 Hispanics, 421 Caucasians, and 12 who categorized themselves as "Other."

Table 1

Demographic Characteristics of Subjects

Gender	
Male	216
Female	335
Generation	
First	436
Second	115
Ethnicity	
Native American	82
African American	21
Hispanic	15
Caucasians	421
Other	12
Household Income	
Low	267
Medium	208
Upper	76

All of the subjects were traditional age college students between 17 and 24 years of age. Students who self-reported their households to be low income comprised 267 of the subjects. There were 208 who selected middle household incomes, and 76 who reported the upper income category (see Table 1).

Hypothesis Testing

The first research question was:

1. Is there a difference in CPT achievement scores (Elementary Algebra, Reading Comprehension, and Sentence Skills) between first-generation and second-generation students that enter the West Campus of TCC?

Table 2 contains descriptive statistics for the effect of generation on the dependent measures EA, RC, and SS. The data presented in Table 2 show that first-generation students scored an average of 39.107compared to second-generation students who scored an average of 46.537 on EA.

Table 2

Descriptive Statistics for EA, RC, and SS by Generation Status

		EA		RC		SS	
	Count	M	SD	M	SD	M	SD
FIRST	436	39.107	19.789	78.569	19.805	80.507	21.494
SEC.	115	46.537	23.974	81.394	19.027	85.099	18.073

A one-way analysis of variance (ANOVA) was performed for each of the dependent measures (Elementary Algebra, Reading Comprehension, and Sentence Skills). Table 3 contains the Sum of Squares, Mean Square, F-value, and p-value for the dependent measure Elementary Algebra (EA).

Table 3

One-Way Analysis of Variance for Effect of Generation on EA

Source	DF	SS	MS	F-Value	P-Value
Generation	1	5024.236	5024.236	11.694*	.0007
Residual	549	235865.589	429.628		

*$p < .05$

The ANOVA on the dependent measure of EA showed significant differences for the effect of Generation (see Table 3). The null hypothesis was rejected for the dependent measure EA.

Table 4 contains a one-way ANOVA table for the effect of generation on the dependent variable of Reading Comprehension (RC). As seen in Table 4, RC was not significantly different between first-generation and second-generation students [$F(1,549) = 1.881$, $p > .05$]. First-generation students did score lower, with an average of 78.569 on RC compared to 81.394 for second-generation students (see Table 2).

Table 4

One-Way Analysis of Variance for Effect of Generation on RC

	DF	SS	MS	F-Value	P-Value
Generation	1	726.159	726.159	1.881	.1707
Residual	549	211899.898	385.974		

$p > .05$

Table 5 presents an ANOVA for the effect of generation on the dependent variable of Sentence Skills (SS). As seen in Table 5, SS was significantly different between first-generation and second-generation students [$F(1, 549) = 4.423$, $p < .05$]. The data contained in Table 2 indicate that first generation students scored an average of 80.507 on SS while second generation students scored an average of 85.099.

Table 5

One-Way Analysis of Variance for Effect of Generation on SS

	DF	SS	MS	F-Value	P-Value
Generation	1	1919.230	1919.230	4.423*	.0359*
Residual	549	238195.641	433.872		

* $p < .05$

2. Do differences in achievement as measured by CPT scores exist between males versus females at the TCC West Campus?

As seen in Table 6, the means for females were higher on SS than for males ($\underline{M}$ = 83.311 and $\underline{M}$ = 78.602, respectively).

Table 6

Descriptive Statistics for EA, RC, and SS by Gender

		EA		RC		SS	
	Count	$\underline{M}$	SD	$\underline{M}$	SD	$\underline{M}$	SD
Female	335	39.659	20.241	77.386	19.664	83.311	20.454
Male	216	42.207	21.908	81.908	19.386	78.602	21.292

Table 7 contains the ANOVA table for a one-way analysis of variance between males and females on the dependent measure EA. The descriptive statistics presented in Table 6 show that females scored an average of 39.659 on EA compared to 42.207 for males. The results depicted in Table 7 indicate that there was no significant difference between males and females on EA scores [$\underline{F}$ (1,549) = 1.950, $\underline{p} > .05$].

Table 7

One-Way Analysis of Variance for Effect of Gender on EA

	DF	SS	MS	F	P
Gender	1	852.694	852.694	1.950	.1631
Residual	549	240037.131	437.226		

$p > .05$

A one-way analysis of variance between males and females on the dependent measure of Reading Comprehension revealed a significant effect of Gender, $F(1,549) = 7.022$, $p < .05$ (see Table 8). The mean score of females, $M = 77.386$, was an average of 4.522 less than the mean score of males, $M = 81.908$ (see Table 6).

Table 8

One-Way Analysis of Variance for Effect of Gender on RC

	DF	SS	MS	F	P
Gender	1	2685.276	2685.276	7.022*	.0083
Residual	549	209940.781	382.406		

* $p < .05$

Having set the alpha level for this research at .05, the effect of Gender on Sentence Skills was statistically significant, $F(1, 549) = 6.741$, $p = .0097$ (see Table 9). The null hypothesis was rejected for the dependent measure of SS.

Table 9

One-Way Analysis of Variance for Effect of Gender on SS

	DF	SS	MS	F	P
Gender	1	2912.695	2912.695	6.741*	.0097
Residual	549	237202.176	432.062		

* $p < .05$

3. Do differences in achievement as measured by CPT scores exist among students of different ethnicities?

The means and standard deviations for EA, RC, and SS by Ethnicity are presented in Table 10.

Table 10

Descriptive Statistics for SS, RC, and EA by Ethnicity

		SS		RC		EA	
	Count	M	SD	M	SD	M	SD
Native	82	78.965	18.367	74.035	18.395	37.791	16.749
Af. Am.	21	85.948	14.760	79.805	16.429	34.557	17.763
Hispanic	15	77.907	18.851	74.833	18.076	42.347	27.603
Cauc	421	81.837	21.690	79.980	20.044	41.468	21.360
Other	12	82.100	20.608	89.625	14.946	40.392	26.610

At alpha = .05, the main effect of Ethnicity on EA failed to reach statistical significance as seen in Table 11 [F (4,546) = 1.013, $p > .05$].

Table 11

One-Way Analysis of Variance for the Effect of Ethnicity on EA

	DF	SS	MS	F	P-Value	Lambda	Power
Ethnicity	4	1775.062	443.766	1.013	.3999	4.053	.314
Residual	546	239114.763	437.939				

$p > .05$

For the dependent variable of Reading Comprehension, the effect of Ethnicity did reach statistical significance to reject the null as seen in Table 12 [F (4,546) = 2.644, p = .0329]. Fisher's PLSD revealed that Native Americans differed significantly from Caucasian and "Other" students (see Table 13).

Table 12

One-Way Analysis of Variance for Effect of Ethnicity on RC

	DF	SS	MS	F	P-Value	Lambda	Power
Ethnicity	4	4040.311	1010.078	2.644*	.0329	10.576	.739
Residual	546	208585.745	382.025				

$p < .05$

Table 13

Fisher's PLSD for Effect of Ethnicity on RC

	Mean Diff.	Crit. Diff.	P-Value	
Native, Af. Am.	-5.769	9.366	.2268	
Native, Hispanic	-.798	10.755	.8842	
Native, Cauc	-5.945	4.623	.0118	S
Native, Other	-15.590	11.837	.0099	S
Af. Am., Hispanic	4.971	12.947	.4510	
Af. Am., Cauc	-.175	8.563	.9679	
Af. Am., Other	-9.820	13.859	.1645	
Hispanic, Cauc	-5.147	10.063	.3155	
Hispanic, Other	-14.792	14.832	.0506	
Cauc, Other	-9.645	11.212	.0916	

As presented in Table 14, at alpha = .05, the main effect of Ethnicity on SS failed to reach statistical significance [F (4,546) = .679, p = .6070].

Table 14

One-Way Analysis of Variance for Effect of Ethnicity on SS

	DF	SS	MS	F	P-Value	Lambda	Power
Ethnicity	4	1187.737	296.934	.679	.6070	2.714	.217
Residual	546	238927.134	437.595				

p > .05

4. Are there statistical interactions among the independent variables of gender and ethnicity as measured by the CPT?

The means and standard deviations on each of the dependent variables are presented in Table 15 for each gender among the various ethnic categories.

Table 15

Descriptive Statistics on EA, RC, and SS by Gender and Ethnicity

		EA		RC		SS	
	N	Mean	SD	Mean	SD	Mean	SD
Female, Native	57	38.175	16.824	72.277	17.863	81.093	17.781
Female, Af. Am.	18	33.217	16.091	78.994	17.363	84.617	15.467
Female, Hispanic	10	50.040	30.886	78.420	19.723	85.640	15.581
Female, Cauc	245	39.790	20.200	78.178	20.170	83.482	21.548
Female, Other	5	52.580	37.597	88.940	15.971	90.900	21.377
Male, Native	25	36.916	16.885	78.044	19.324	74.112	19.120
Male, Af. Am.	3	42.600	29.001	84.667	9.758	93.933	5.784
Male, Hispanic	5	26.960	8.748	67.660	13.109	62.440	15.780
Male, Cauc	176	43.803	22.730	82.488	19.652	79.548	21.742
Male, Other	7	31.686	11.985	90.114	15.453	75.814	19.062

Table 16 presents a 2 X 5 (Gender X Ethnicity) analysis of variance on the dependent variable EA. As seen in Table 16, the main effects of Gender and Ethnicity failed to reach statistical significance at the alpha = .05 level [$F(1, 541) = 2.131$, $p = .145$; and, $F(4, 541) = .741$, $p = .564$, respectively]. The Gender X Ethnicity interaction, however, did show a statistical difference at the alpha = .05 level [$F(4, 541) = 2.52$, $p = .0403$]. Based on these data, as presented in Table 16, the null hypothesis was rejected for the dependent variable EA.

Table 16

Two Factor (Gender X Ethnicity) Analysis of Variance on EA

	DF	SS	MS	F	P-Value	Lambda	Power
Gender	1	922.230	922.230	2.131	.1450	2.131	.291
Ethnicity	4	1283.734	320.933	.741	.5640	2.966	.234
Gend * Ethnic	4	4362.965	1090.741	2.520	.0403*	10.080	.715
Residual	541	234161.899	432.832				

*$p < .05$

The 2 X 5 (Gender X Ethnicity) analysis of variance presented in Table 17 for the dependent variable RC showed that the effects of Gender and Ethnicity as well as the Gender X Ethnicity interaction failed to reach statistical significance at the alpha = .05

level [F(1, 541) = .091, p = .7631; F(4, 541) = 2.211, p = .0666; and, F(4, 541) = .539, p = .7069, respectively].

Table 17

Two Factor (Gender X Ethnicity) Analysis of Variance on RC

	DF	SS	MS	F	P-Value	Lambda	Power
Gender	1	34.560	34.560	.091	.7631	.091	.060
Ethnicity	4	3361.297	840.324	2.211	.0666	8.843	.646
Gend * Ethnic	4	820.073	205.018	.539	.7069	2.158	.178
Residual	541	205632.787	380.098				

Similarly, as seen in Table 18, at alpha = .05, the Gender, Ethnicity, and Gender X Ethnicity interactions all failed to reach statistical significance on the dependent variable of SS [F(1, 541) = 3.349, p = .0678; F(4, 541) = 1.345, p = .2518; and, F(4, 541) = 1.220, p = .3012, respectively]. Based on the data presented in Tables 17 and 18, the null hypotheses for RC and SS as related to gender and ethnicities were not rejected.

Table 18

Two Factor (Gender X Ethnicity) Analysis of Variance on SS

	DF	SS	MS	F	P-Value	Lambda	Power
Gender	1	1447.321	1447.321	3.349	.0678	3.349	.430
Ethnicity	4	2326.003	581.501	1.345	.2518	5.382	.412
Gend * Ethnic	4	2108.997	527.249	1.220	.3012	4.880	.375
Residual	541	233814.527	432.190				

5. Are there differences in achievement scores as measured by the CPT among students from low, middle and upper income households?

Table 19 depicts the means and standard deviations by income level on each of the three dependent variables.

Table 19

Descriptive Statistics on EA, RC, and SS by Household Income Level

		EA		RC		SS	
	N	Mean	SD	Mean	SD	Mean	SD
Low	267	37.232	19.351	77.149	19.243	79.235	21.050
Middle	208	43.680	21.489	79.428	20.636	82.787	20.854
Upper	76	44.421	22.973	85.480	17.067	85.683	19.723

As seen in Table 20, at alpha = .05, the effect of Income on the dependent variable EA was statistically significant [$F(2, 548) = 7.131$, $p = .0009$].

Table 20

One-Way Analysis of Variance for Effect of Household Income on EA

	DF	SS	MS	F	P	Lambda	Power
Income	2	6110.330	3055.165	7.131	.0009	14.262	.945
Residual	548	234779.495	428.430				

Fisher's PLSD for the effect of Income on EA, shown in Table 21, indicated that the Mean Differences between Low and Middle income students (-6.448) and between Low versus Upper income students (-7.189) were significantly lower than the expected critical difference values (3.761 and 5.287, respectively), $p = .0008$ and $p = .0078$, respectively. The mean difference of middle income versus upper income subjects (-.741) was not significantly different from the expected value of 5.451, $p = .7896$.

Table 21

Fisher's PLSD for Effect of Household Income on EA

	Mean Diff.	Crit. Diff.	P-Value	
Low, Middle	-6.448	3.761	.0008	S
Low, Upper	-7.189	5.287	.0078	S
Middle, Upper	-.741	5.451	.7896	

The ANOVA table presented in Table 22 shows a significant effect of Income on RC [$F(2, 548) = 5.428$, $p = .0046$]. Further analysis utilizing Fisher's PLSD showed that the mean differences on RC of upper income students were significantly different from both low income and middle income students (see Table 23).

Table 22

Analysis of Variance Table for Effect of Household Income on RC

	DF	SS	MS	F	P	Lambda	Power
Income	2	4130.566	2065.283	5.428	.0046	10.857	.857
Residual	548	208495.490	380.466				

Table 23

Fisher's PLSD for Effect of Household Income on RC

	Mean Diff.	Crit. Diff.	P-Value	
Low, Middle	-2.279	3.543	.2069	
Low, Upper	-8.331	4.981	.0011	S
Middle, Upper	-6.052	5.136	.0210	S

The ANOVA presented in Table 24 shows that the main effect of Income on the dependent variable SS did reach significance for rejection of the null hypothesis [F(2, 548) = 3.518, p = .0303]. Further analysis utilizing Fisher's PLSD indicated that upper income students were significantly different from low-income students (see Table 25). The results in this area showed that Income was a significant main effect on each of the three dependent variables. The null hypotheses relating to income were rejected.

Table 24

Analysis of Variance Table for Effect of Household Income on SS

	DF	SS	MS	F	P	Lambda	Power
Income	2	3043.582	1521.791	3.518	.0303	7.035	.651
Residual	548	237071.289	432.612				

Table 25

Fisher's PLSD for Effect of Household Income on SS

	Mean Diff.	Crit. Diff.	P-Value	
Low, Middle	-3.552	3.778	.0653	
Low, Upper	-6.448	5.312	.0174	S
Middle, Upper	-2.896	5.476	.2994	

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The placement of incoming students into the proper foundation courses helps chart a path for student success. Riehl (1994) stressed the importance of obtaining a better picture of the academic abilities of students admitted to community colleges. At many institutions of higher education, and at most community colleges, the placement of students into developmental, or zero level, courses based on the outcome of a testing procedure may be mandatory, regardless of the wishes of the students. Shults (2000) noted that such mandatory testing and placement of students into remedial courses is highly debated.

Concerns regarding disparity in testing and placement related to the gender, ethnicity, income and generational status of students have received growing attention (Wall, 2000). The potential for testing bias, an issue that exists with paper and pencil tests, that for some students could be exacerbated by the growing use of computerized testing warrants additional consideration. "If a particular group has disproportionate access to computers and technology, disparity could be created by the medium alone" (Wall, 2000 p. 4). Yet, the required use of testing and mandated course placement continues due largely to the belief that a student's early experiences are critical to future success. Clearly, students who are successful early in their academic careers have higher persistence and more success throughout their academic careers (Gordon, 1999).

In Oklahoma, the state chosen for this study, the accuracy of mandatory placement is critical as the Oklahoma State Regents for Higher Education prescribe such placement. This study investigated whether the participants' genders, ethnicities, household income levels, or statuses as a first-generation or non-first generation student affected student placement scores. The EA, RC, and SS sub-scores of the CPT were chosen as the dependent variables as the CPT is widely used and accepted as a placement instrument. Each of the constructs chosen for inclusion as an independent variable has been shown by previous research to be related to important student issues centering on collegiate entry, integration and success.

In addition to Caucasian, African American and Hispanic students, the study specifically identified Native American students, a group frequently overlooked in research efforts. Similarly, little research has been presented in the literature to delineate possible effects of household income levels on placement test scores. While gender and status as a first-generation student have received some attention, neither has been sufficiently studied in relation to effects on placement scores, particularly in conjunction with the other variables included in this study.

The null hypotheses tested were:

Ho1: There are no significant differences in achievement level scores as measured by the CPT of first-generation students versus their non-first generation peers.

Ho2: There are no significant differences in achievement as measured by CPT scores between males versus females.

Ho3: There are no significant differences in achievement as measured by CPT scores among students of different ethnicities.

Ho4: There are no significant interactions between achievement scores as measured by the CPT among the independent variables of gender and ethnic group classification.

Ho5: There are no significant differences in achievement scores as measured by the CPT among students from low, middle and upper income households.

The results of this study were meaningful. All five of the null hypotheses were rejected on at least one of the dependent measures. The results of the testing of each hypothesis will be summarized in detail then discussed further in the next section.

In relation to the first null hypothesis, first-generation students scored lower than second-generation students did on each of the three dependent variables. The differences reached statistical significance on the factors of EA and SS. However, given the exploratory nature of this research, it is worth noting that the differences found in relation to RC were in the predicted direction.

Gender appears to be an important issue in relation to placement test scores. Females scored lower than males on EA, but the differences failed to reach statistical significance. The null hypothesis was rejected in relation to the dependent variable of RC where females scored significantly lower than males. Conversely, females scored significantly higher than males on SS.

Ethnic background appeared to be a relevant factor in this study. Only the dependent measure RC varied significantly based on ethnicity. Post hoc comparisons between Native American students as compared to both Caucasian and "Other" students

were significantly different on the dependent measure RC with Native students' scores being lower.

A significant Gender X Ethnicity interaction on the dependent variable of EA resulted in rejection of H04. The Gender X Ethnicity interactions on the other two dependent variables, RC and SS, failed to reach statistical significance.

Household Income appears to have a notable effect on the placement scores of students as measured by the CPT. Findings of significance for each of the dependent variables resulted in rejection of Ho5.

Conclusions

1. Elementary Algebra skills, Reading Comprehension skills, and knowledge related to Sentence Skills vary among college students. On the constructs EA, RC, and SS as measured by the CPT, EA and SS scores vary significantly based on the generational status of the students. First generation students scored lower than did second-generation students as predicted by the literature. Although the difference on Reading Comprehension did not reach significance, the difference was in the expected direction with second-generation students scoring higher. This finding is consistent with Riehl (1994), Choy (2001) and Warburton, Bugarin and Nunez (2001) who found lower college admission test scores for first-generation students, although the tests under their review were primarily the SAT or ACT.

Some researchers have suggested that compared to second-generation students, first-generation students experience a much greater disjuncture in their lives by entering college (London, 1992; Rendon, 1995). The novel environment, jargon, and procedures

related to the college environment may make these students feel out of place. It is plausible that this uneasiness could affect their performance on any number of college procedures, especially those imposed upon entry, such as placement testing.

Moreover, second-generation students may have a psychological advantage. Entering college simply means doing what they have been planning, what their parents have prepared them to do. Second-generation students have the advantage of greater parental expectation and support (Billison & Terry, 1982; Stage & Hossler, 1989; Terenzini et al., 1996). It seems logical that increased self-confidence would be manifested by these students simply being where they have been prepared and are expected to be. This advantage could play a pivotal role in the initial integration of students into college.

2. Comparing RC and SS scores by gender showed that female students scored higher on SS and lower on RC. Both of these findings are consistent with previous research which has shown that females do better on tests and assignments related to writing (e.g., SS) while male students score higher on items related to abstract thinking and interpretation (e.g., RC). Although the distinct writing advantage experienced by females during their public school years appears to lessen by the time they enter college, the literature overall supports the notion that females outperform males on tests of writing or verbal skills (Bae et al., 2000).

One important ramification of stronger writing achievement for females is that such competence can influence the selection of college major and, thus, ultimate career choice. This may actually result in negative labor market outcomes for females since the

fastest growing and most lucrative jobs require strong skills in math, science and technology.

Although the gender difference on EA did not reach statistical significance, it was in the direction suggested by the literature, with males scoring higher than females. Bae et al. (2000) and Coley (2001) found that males tend to score higher than females on tests of mathematics and science. Some authors suggest that this differential may be the result of attitudinal factors, with females more likely to indicate they do not like math or believe they are good at it (Bae et al., 2000). Initiatives designed to involve females in math and science with a specific emphasis on confidence-building could prove beneficial.

The early administrations of the major college admissions tests, such as the SAT, showed a distinct advantage for males in Math and an advantage for females in Verbal skills. The disparity in the Verbal component subsequently closed, due in part to changes in the content of the Verbal section ("FairTest," 2003). Efforts to better "balance" the test resulted in the inclusion of more questions on sports, business and politics. Critics question why the same balancing was not performed for the Math component.

Correspondingly, one possible reason that males outperformed females on Reading Comprehension in this study could be the design of the test itself. The CPT Reading Comprehension test contains content categories of arts, human relations and practical affairs, social sciences, and natural and physical sciences (The College Board, 1997). Examinees receive two to three questions from arts, three to five questions from human relations and practical affairs, but four to six questions from social sciences and natural and physical sciences. Thus, students will receive more questions on science and this could possibly be an advantage for males since the literature suggests that males

outperform females on tests of science (Bae et al., 2000). Whether this test characteristic is sufficient to explain the gender differences found in this study would require a detailed examination of the CPT Reading Comprehension test, which is beyond the scope of the current investigation.

It is unknown whether other aspects rather unique to the CPT might differentially affect student groups, such as those analyzed in this study. For example, it has been suggested that males have an advantage on multiple-choice format tests and that females benefit from un-timed tests ("FairTest," 2003). Since the CPT is an un-timed, multiple-choice exam, it is unclear whether these test characteristics favor one gender over the other.

3. Placement scores as measured by the CPT differed some based on the ethnicity of the student. Caucasian students scored higher on RC than did Native American Students. Also on RC, Native American students scored lower than did students listed as "Other." None of the other comparisons among ethnicities reached statistical significance.

Overall, the literature would not have predicted the results of this study with respect to ethnicity. For example, Camara and Schmidt (1999) found consistent results in analyzing student performance on the SAT and ACT. Generally, African American students had substantially lower scores than Caucasians. Hispanics scored higher than African Americans overall, but also substantially lower than Caucasians. The global conclusions from past research related to ethnicity and test bias would lead one to believe that differences would likely exist on each of the three dependent variables in this study. The West Campus of TCC primarily serves working class and smaller, more rural communities. Minority students from the West Campus service area may not be

reflective of minority students overall. It is possible that a broader study, incorporating larger numbers of subjects from varied locations, would find different results. In particular, a larger number of African American and Hispanic students would have been beneficial to this study.

4. Interactions among the ethnicities and genders of students impacted scores on the EA scale of the CPT. Contrary to the national picture, but consistent with Oklahoma higher education overall, the largest number of ethnic minorities at the West Campus were Native Americans. The low number of the other minority groups was a limiting factor in this research paradigm. Therefore, any conclusions must be made with caution.

Another limiting factor was the high number of comparisons possible by gender and ethnic category. With five levels of ethnicity and two levels of gender, there were far too many combinations possible to allow for more specification in relation to the nature of the interactions between gender and ethnicity. A future study with much higher numbers of subjects and fewer ethnic categories could prove beneficial in identifying interactions if indeed they exist.

5. Household incomes of students significantly influenced student academic achievement as measured by the EA, RC, and SS scales of the CPT. Students from families with low household incomes scored lower on every dependent variable. For EA, students from low-income households scored significantly lower than students from both middle and upper-income households. In relation to RC, students from upper-income households scored significantly higher than students from both low and middle-income households. On the CPT construct SS, the smaller scores of students from low-income

households were significantly different from the scores of students from upper-income households.

Results from this study support the literature that income is an important factor in college readiness. Low-income students are less prepared for college than their higher income peers. Evaluating 1992 high school graduates, the U.S. Department of Education (2000) found that only 21 percent of students with family incomes less than $25,000 were highly qualified for entry, compared to 56 percent for those with family incomes over $75,000. Although that particular study focused on students entering four-year institutions, it is consistent with the current study in highlighting the general under preparedness of lower income students.

Better understanding the impact of income is essential in facilitating student entry and retention. There is no doubt that lower income students possess many of the characteristics associated with college attrition. Working full-time, starting at a community college and being a first-generation student are notable among these attributes (Choy, 2002). In addition, extending the time to degree completion, a logical result when students work more hours or must take remedial courses, may compromise student persistence.

Recommendations

This section presents two major categories of recommendations. First, four areas of recommendations are presented for future research. These key research components focus on increasing institutional scope, analyzing additional instruments, incorporating objective means of verification of independent variable categories, and the use of

outcome measures for validating placement tests. The second area of recommendations includes suggestions for practitioners.

Recommendations for Research

1. Future research that broadens the institutional scope could prove beneficial. The current study examined students at only one campus of a multi-campus community college. Replicating the current study by utilizing additional colleges, and possibly across other states, would strengthen the ability to generalize the results. Including additional colleges would also increase the number of subjects for the research. The current study could have benefited from additional numbers of Hispanic and African-American subjects.

2. The dependent variables used in this study came from one entry-level test, the CPT. Certainly, other instruments should be evaluated. Another computerized placement test in wide use is COMPASS, developed and distributed by ACT, Inc. Albeit similar in many respects to the CPT, the COMPASS contains options that allow more detailed analysis of sub-test scores. In addition to computerized placement instruments, pencil and paper tests, such as the ASSET by ACT, are still in wide use and should be considered for additional inquiry. The ASSET was specifically designed for students entering two-year colleges.

3. Educational research frequently utilizes self-report methods of gathering data. In many instances, however, utilizing independent means of verification is preferable. For example, the current study used self-reported indicators of household income. Quite likely, many students do not have a precise knowledge of this information. In addition, it

could be that younger students, such as those used in the present study, are more likely to be dependent and living at home. This group may be less likely to know their household income than their more independent, older counterparts may. Consequently, future efforts that involve more precise, independent means of measurement could enhance this area of research. Similarly, future research might focus on the actual involvement of first-generation versus second-generation students, especially in activities typically identified as enhancing social and academic integration. If first-generation students are older, as the literature suggests, typical measures of academic and social integration, usually gathered via questionnaires, might not allow a valid determination of their integration.

4. This study focused on student input characteristics on placement test scores. Although past research has attempted to examine the value of placements tests in the context of obvious outcome indicators, such as end-of-course grades, such measures are frequently confounded. For example, end-of-course grades would be a useful indicator only if faculty grading practices were standardized. Future research should employ follow-up measures that can applied in a uniform fashion to gain a clearer picture of the impact placement test scores are having on student success.

Recommendations for Practice

Suggestions for practitioners focus on the creation of intrusive teams, utilizing bridge programs and implementing special workshops. In addition, important issues

regarding computerized assessment, as well as innovative approaches to course offerings and financial assistance are presented.

The literature suggests that efforts to help at-risk students succeed in higher education must begin early and incorporate critical teams. Without guidance, these students are less likely to take courses to prepare themselves for college. An intrusive team approach involving the student, parents, teachers, counselors and college representatives should be initiated. Beginning when the student is in junior high, the team can plan a college track curriculum that results in rigorous courses being taken in high school.

Bridge programs have been used to help first-generation and other at-risk students successfully make the transition from high school to college. Such programs entail a joint effort of the high schools and community colleges, and sometimes involve universities. High school students are given the opportunity to take several of their classes on the college campus. Other bridge programs take place in the summer prior to students' college entry and tend to focus on enhancing basic skills. Students have the opportunity to experience a college environment while taking classes that are of small size and taught by supportive teachers. Some consider bridge programs to be the most effective institutional strategy for helping at-risk students (Richardson and Skinner, 1992).

An example of a successful bridge program is the Jump Start initiative at Miami-Dade Community College. This program targets high school students who have high test scores and grades, but are otherwise hesitant about attending college (Padron, 1992). The

Jump Start program includes summer classes as well as a course on college survival skills.

College counselors can develop and present workshops for students and parents about what college is all about. Components should entail aspects that are important for college success but most likely unknown to first-generation and other at-risk students and their parents. Workshop content might include explanations for terminology used in higher education, as well as the way courses and semesters are organized. Attendance and study requirements necessary for success, in addition to strategies to balance work and college, could be addressed. The availability and means of acquiring support services, including strategies that facilitate social and academic integration, would be essential. Finally, strategies specific to acquiring student financial assistance including required forms, processes, and deadlines, should all be covered.

Hellman (1996) advocated for a broad range of programs to facilitate the integration and success of first-generation students, such as focus groups, pre-entry workshops, special orientation sessions, and mentoring programs. He suggested that including students' family members and support networks is a key ingredient for promoting the successful integration and retention of first-generation students. Similarly, Riehl (1994) advocated for orientation programs specifically targeted to the parents of first-generation students. In addition to helping them understand the higher education environment, parents could be taught how crucial their involvement and support are in their children's success.

The way in which many colleges are able to provide needed services for at-risk students is by vigorous efforts to garner outside funding. TRIO grants, provided by the

U.S. Department of Education, are specifically designed to help underrepresented populations access and succeed in higher education.

Computerized assessment for entering students provides many advantages. The large bank of test questions from which the program selects items for a specific test administration reduces the need for human proctors. The adaptive, branching function of most computerized tests reduces testing time and student frustration by customizing the test to the skill level of the student. In many cases, test scoring and feedback to the student are almost immediate. However, educators must be sensitive to other considerations. By allowing the computer to "do it all," crucial human contact and intervention may be dissipated (Wall, 2000). Many students, especially those considered "at-risk," benefit from having a trained counselor spend time with them interpreting the scores, discussing the ramifications of the exam, and facilitating their acquisition of needed support services. In addition, educators must realize that students who are more affluent and those with prolific computer backgrounds may be more experienced taking tests via a computer. Consequently, they may have an advantage over those of less affluent means. The equity, applicability, and accuracy of computerized assessment for all student populations should not be assumed. Cress (1996) cautions, "Assessment activities need to take into consideration the needs of culturally, ethnically, religiously, and linguistically diverse students" (p. 3).

Shults (2000) advocated for a holistic approach to remedial education. Flexible course offerings, including open-entry, open-exit methods, should be considered. In addition, colleges should consider remedial-specific support services in the form of

special remedial orientation programs, sufficient tutorial services on campus and at a distance, remedial-specific advising, and mentoring programs.

Interventions during the first semester and year of college can be helpful to students and faculty. Such programs, usually referred to as Academic Alert or Early Alert, use intrusive measures at selected intervals to intervene with students who are demonstrating weak performance. Such a program at the Wolfson campus of Miami-Dade Community College involves sending to students individualized letters with follow-up phone calls by counselors (Padron, 1992).

Learning communities, a relatively new concept in instructional methodology and scheduling, could be particularly well suited for first-generation and other at-risk students. Educators should consider organizing courses into logical clusters that center on relevant themes. They should be offered in organized blocks of time, thus allowing students to better plan and coordinate their academic life with their many other obligations. Student teams would be able to progress through the degree requirements together. Consequently, student retention should be facilitated by enhanced social and academic integration.

The literature suggests that low-income families are not knowledgeable about financial aid programs or even how to acquire the information. Without help, these families are more likely to conclude that higher education is beyond their means. Their children will be less likely to enroll in college and the cycle of poverty will continue. Intrusive strategies to get college cost and financial aid information into the hands of low-income parents are crucial. Colleges and high schools should work cooperatively to educate students and parents about means of financial assistance while the student is still

in high school. Staying connected with these families through follow-up measures should be a standard component of such initiatives.

Higher education leaders should work with legislators to review financial aid regulations. It appears reconfiguring the manner in which financial aid is awarded could enhance the collegiate success of low-income students. Students with the greatest fiscal need usually receive a combination of grants and loans throughout their college course of study. However, a study by the U.S. General Accounting Office found that grants were most effective in reducing the attrition of low-income students when given in their first year of college (Dervarics, 1997). The study found that grant-specific funding did not have a retention effect for the third and fourth year. With increasing tuition costs, many low-income students are hesitant about entering higher education, and those who do may be plagued with doubt and worry over their mounting financial debt. A concept called "frontloading" has been proposed to enhance the retention of financially disadvantaged students by primarily awarding grants during the first two years, and loans for the junior and senior years (Dervarics, 1997).

The literature supports the notion that males and females continue to choose their college majors in a rather gender stereotyped manner. This appears to be a cause for females continuing to lag behind males in important labor market outcomes, such as salary. Educators must help students consider the vast array of career fields and select their college major with a more open mind.

Concluding Thoughts

In light of the widespread use of placement tests in general and the CPT in particular, the results of this study add important "food for thought" for practitioners and researchers alike. If, for example, larger studies were to support the findings that CPT scores are influenced by gender, ethnicity, status as a first generation student, household incomes, and even gender and ethnic interactions, then the practice of having firm cut-off scores for placement into certain courses would be highly questionable. In other words, one would have to wonder if females are truly less prepared for math as indicated by having lower CPT scores as found in this study, or, conversely, whether the EA scale of the CPT is in some way gender biased against females.

Similar questions would arise for each of the alternative hypotheses. If the CPT is indeed biased, then for placement to be accurate and equitable, practitioners would have to establish separate placement scores for students of different ethnicities, by gender, by different household incomes, and by status of being a first or second-generation student. If researchers conclude that the variations in scores are from true differences in abilities, then implications arise concerning the need for early recognition and assistance to students based on the factors in this study.

The underlying issues addressed in this study have been about fundamental fairness and equity in the process of placing students into appropriate courses. The ability to place students based on academic achievement independent of extraneous influences would be most beneficial to students, professionals, and the college administrative structure. This study identified five independent variables that appear to confound the placement process to some degree. It is vitally important that this type of

research continue. Student affairs professionals must be ever vigilant in questioning practice and in exploring new means to improve the success of students.

Access and support are cornerstones of the community college and fundamental to its mission. An equitable process for college entry and integration is essential for all students, but particularly crucial for students considered at-risk for failure. The choice for many disenfranchised students is not whether they will attend the state university or a community college; it is whether they will be provided a positive community college experience or no higher education at all. The community college represents their higher education opportunity for achieving the American dream. Ensuring that policies and procedures are fair to all students is paramount. As Astin (1991) poignantly noted, "Guaranteeing that opportunities are available for all does not ensure equity unless the opportunities themselves are comparable" (p. 198).

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APPENDIX

APPENDIX A

INSTITUTIONAL REVIEW BOARD

APPROVAL FORM

Oklahoma State University
Institutional Review Board

Protocol Expires: 2/17/2004

Date: Tuesday, February 18, 2003 IRB Application No ED0378

Proposal Title: IMPLICATIONS FOR EQUITY IN ENTRY-LEVEL ASSESSMENT: AN EXAMINATION OF STUDENT CHARACTERISTICS ON PLACEMENT SCORES

Principal Investigator(s):

Jimmy Mark Ames
12202N. 70th East Ave
Collinville, OK 74021

Deke Johnson
310 Willard
Stillwater, OK 74078

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact Sharon Bacher, the Executive Secretary to the IRB, in 415 Whitehurst (phone: 405-744-5700, sbacher@okstate.edu).

Sincerely,

Carol Olson

Carol Olson, Chair
Institutional Review Board

VITA 2

Jimmy Mark Ames

Candidate for the Degree of

Doctor of Education

Thesis: IMPLICATIONS FOR EQUITY IN ENTRY-LEVEL ASSESSMENT: A STUDY OF SELECTED STUDENT CHARACTERISTICS AND PLACEMENT TEST SCORES

Major Field: Higher Education Administration

Biographical:

Education: Graduated from Thomas High School, Thomas, Oklahoma in May 1970; received Bachelor of Science degree in Psychology from Southwestern Oklahoma State University, Weatherford, Oklahoma in December 1976; received Master of Science degree from Southwestern Oklahoma State University, Weatherford, Oklahoma in December 1980. Completed the requirements for the Doctor of Education degree with a major in Higher Education Administration at Oklahoma State University, Stillwater, Oklahoma in May 2003.

Experience: Employed as Director of Residential Life at Murray State College, Tishomingo, Oklahoma from 1985 to 1987. Employed as Director of Counseling at Pratt Community College, Pratt, Kansas from 1986 to 1987. Employed as Director of Counseling and Assessment at Oklahoma State University-Oklahoma City, Oklahoma City, Oklahoma from 1987 to 1995. Employed as Dean of Student Services at Tulsa Community College, Tulsa, Oklahoma from 1995 to present.

Professional Memberships: Association of Student Judicial Affairs, Oklahoma Association of Community Colleges, Oklahoma College Student Personnel Association.